EXHIBIT
8

EXHIBIT
8

The Role of Financial Economics in Securities Fraud Cases: Applications at the Securities and Exchange Commission

*By Mark L. Mitchell and Jeffry M. Netter**

INTRODUCTION

Litigants, including the Securities and Exchange Commission (SEC), increasingly have applied modern financial economics in securities fraud cases. One of the most important applications of financial economics for securities law comes from the efficient markets hypothesis. This Article presents an overview of areas where securities fraud law has adopted some of the reasonings and applications of the efficient markets hypothesis and provides examples of the use of financial economics in SEC enforcement actions. Specifically, this Article discusses how techniques developed by financial economists can be used to establish the materiality of information allegedly used in securities fraud, and to compute profits (or losses avoided) resulting from fraudulent actions. It then shows how the methodology was applied in recent SEC enforcement cases.

A leading expert on the efficient markets hypothesis, Professor Eugene F. Fama of the University of Chicago's Graduate School of Business, recently reviewed the empirical evidence on the efficient markets hypothesis and defined market efficiency with the simple statement that security prices fully reflect all available information.[1] Fama noted that, while no market is perfectly efficient, the idea that prices quickly adjust to the release of new information is a useful tool to analyze many situations, especially when information and transactions costs are low, as in the United States stock market.

An event study, a technique developed and refined by financial economists, can be very useful in securities fraud cases. An event study relates changes in stock prices to the release of new information. Researchers have applied event studies to all types of events ranging from mergers to regulatory actions. In securities fraud law, event studies are particularly

*Both authors formerly worked at the United States Securities and Exchange Commission. The views expressed here are those of the authors and do not necessarily reflect the views of the Commission.

1. Eugene F. Fama, *Efficient Capital Markets: II*, 46 J. FINANCE 1575 (1991).

beneficial because they allow the investigator to discern whether information that is used in an allegedly fraudulent action is important to investors and to determine the value of the information. This Article illustrates the application of this event study methodology in SEC enforcement cases. The application, however, can be used easily in private suits as well.

While financial economics is becoming increasingly important in securities fraud law, both indirectly through the courts' approach to certain issues and directly through its application in specific cases, many litigants have not been exposed to this application or to a detailed description of the methodology. Recognition of the important relationship between economics and the law by the legal community, however, is not a new development. In 1897, Justice Oliver Wendell Holmes, Jr. said: "For the rational study of the law the black-letter man may be the man of the present, but the man of the future is the man of statistics and the master of economics."[2] Over the intervening years, the legal profession adopted many economic theories and reasonings. The application of financial economics in litigation has lagged behind other fields in economics largely because many of the accepted theories in finance are relatively new.[3] Today, the courts are more receptive to the use of financial economic analysis. For instance, in 1988 when the United States Supreme Court adopted the fraud-on-the-market theory in *Basic, Inc. v. Levinson*,[4] it stated: "Recent empirical studies have tended to confirm Congress' premise that the market price of shares traded on well-developed markets reflects all publicly available information, and, hence, any material misrepresentations."[5] This type of reasoning suggests the manner in which financial economics is used in securities fraud litigation and will be analyzed in this Article. While litigants in private and public suits have used financial economics in connection with a variety of securities issues, this Article will focus on the recent application in SEC enforcement cases.

THE BASIS FOR FINANCIAL ECONOMICS ANALYSIS IN SECURITIES FRAUD CASES

In an influential article published in *The Business Lawyer* in 1982, Professor Daniel R. Fischel argued that in a rule 10b-5 suit the court should determine whether the stock price was "artificially affected by false information" instead of separate determinations into materiality, reliance, causation, and damages.[6] While courts have not followed Fischel's [suggestion] unanimously, they have relied directly on the efficient markets hypothesis in recent years with the use of evidence provided by expert testimony of financial economists and indirectly through the acceptance of many of the implications flowing from the hypothesis.

FRAUD-ON-THE-MARKET THEORY

The seminal adoption of financial economics in securities fraud litigation is in the fraud-on-the-market theory, which enables a plaintiff who has not actually seen a misleading statement to satisfy, nevertheless, the reliance requirement in a fraud suit. Fischel noted that the fraud-on-the-market theory originated to ease the proof of reliance in large class action suits.[7] A derivative of the efficient markets hypothesis, the fraud-on-the-market theory assumes that investors rely on the market price of a security as a reflection of its value.[8] Thus, a misleading statement that distorts securities prices is fraudulent even if the average securityholder has no knowledge of the statement.[9] Applying the fraud-on-the-market theory, a court can presume the plaintiffs relied on the integrity of the market price for the securities they bought or sold, therefore dispensing with the traditional reliance requirement that the plaintiff relied on the fraudulent statement in making his or her investment decisions.[10]

The acceptance of the fraud-on-the-market theory varied among lower courts until *Basic, Inc. v. Levinson*.[11] In this case, corporate officers of Basic, Inc. falsely denied the existence of on-going merger negotiations with Combustion Engineering during 1977-1978. In fact, "[n]ot only was Basic [Inc.] involved in negotiations, but on December 20, 1978, Basic [Inc.] announced that its Board of Directors had approved a tender offer by Combustion Engineering."[12] Stockholders, who sold stock after officers in Basic, Inc. first denied merger negotiations and before the merger announcement, sued claiming a violation of rule 10b-5.[13] The United States Supreme Court held that plaintiffs may use the fraud-on-the-market theory to presume reliance so long as plaintiffs can show the affected shares traded in an "efficient" market.[14]

2. Oliver Wendell Holmes, Jr., *The Path of the Law*, in COLLECTED LEGAL PAPERS 167, 187 (1920).

3. For example, it was not until 1990 that the Nobel Prize Committee recognized finance as a legitimate scientific area of study within the field of economics and awarded the Nobel Prize in Economics to three researchers, Harry Markowitz, Merton Miller and William Sharpe, for their seminal contributions to the field of finance.

4. 485 U.S. 224 (1988).

5. *Id.* at 246.

6. Daniel R. Fischel, *Use of Modern Finance Theory in Securities Fraud Cases Involving Actively Traded Securities*, 38 BUS. LAW. 1, 13 (1982).

7. *Id.* at 9.

8. *See generally* Jonathan R. Macey et al., *Lessons From Financial Economics: Materiality, Reliance, and Extending the Reach of* Basic v. Levinson, 77 VA. L. REV. 1017, 1020 (1991).

9. *Id.*

10. *Id.*

11. 485 U.S. 224 (1988).

12. Macey, *supra* note 8, at 1018.

13. *Basic*, 485 U.S. at 228.

14. *Id.* at 245. Inquiry into whether a stock trades in an efficient market is unnecessary. Instead, courts should address whether a misstatement caused the stock to trade at an artificially low or high price. Macey, *supra* note 8, at 1021.

The fraud-on-the-market theory is useful to those attempting to satisfy the reliance requirement in private rule 10b-5 suits such as *Basic*. The acceptance of the theory by lower courts and the United States Supreme Court, however, also provided an intellectual basis for the application of financial economics in other contexts such as the SEC's use of financial economics in its enforcement actions. The two primary elements of rule 10b-5 cases that directly relate to SEC securities fraud cases are materiality and disgorgement.

MATERIALITY

A key element of a rule 10b-5 case is proof that the fraudulent or inside information is material.[15] The plaintiff must establish the importance of information provided in the fraudulent statements or of information exploited in insider trading.

Standards for Materiality

The materiality requirement originated in the common law of fraud, which is the basis for the courts' general interpretation of rule 10b-5. According to the United States Supreme Court, "materiality may be characterized as a mixed question of law and fact, involving as it does the application of a legal standard to a particular set of facts."[16] Arnold S. Jacobs suggested there are three interrelated groups of materiality standards that courts use—reasonable investor, probability/magnitude, and market impact.[17]

The United States Supreme Court in *Basic* described the reasonable investor approach as "[a]n omitted fact is material if there is a substantial likelihood that a reasonable shareholder would consider it important."[18] The Court expressly adopted the reasonable investor standard of materiality for all section 10(b) and rule 10b-5 cases.[19] The probability/magnitude approach concerns events that do not always take place. For example, in *Basic* the SEC urged the Court to treat preliminary merger negotiations as material under this probability/magnitude standard.[20] The SEC argued that while a merger might not actually result from negotiations, the possibility of the merger occurring combined with the potential large market impact indicates the materiality of information regarding preliminary merger negotiations.[21] The third standard, market -, defines materiality in terms of whether the relevant information, if released, would have had an impact on the price of the affected securities.[22] The United States Court of Appeals for the Second Circuit, in the influential *SEC v. Texas Gulf Sulphur Co.* case,[23] defined materiality under the market impact approach as "those situations which are essentially extraordinary in nature and which are reasonably certain to have a substantial effect on the market price of the security."[24]

These three standards, however, are certainly not mutually exclusive; some courts applied more than one standard in the same case. For example, in adopting the reasonable investor standard in *Basic*, the Court suggested the probability/magnitude test could be used to analyze the importance a reasonable investor would attach to preliminary merger negotiations.[25] Similarly, in *Texas Gulf Sulphur*, the Second Circuit employed all three standards to determine the materiality of news about an ore discovery.[26] Most importantly for financial economics, courts sometimes applied a market impact test to determine whether information met the reasonable investor standard.[27]

Materiality and Financial Economics

Information allegedly used in fraudulent activity that is important enough to affect security prices when publicly released provides compelling evidence that a reasonable investor would consider the information important in making an investment decision. In *SEC v. Tome*,[28] for example, the United States District Court for the Southern District of New York, using the reasonable investor standard to determine materiality in an insider trading case, stated: "The significance of this information to investors is highlighted by the temporary halting of trading in St. Joe securities and by the virtually immediate jump in price of St. Joe stock from approximately $30 per share to approximately $45 per share when the Seagram tender offer was publicly announced. . . ."[29]

Historically, however, evidence that information is important enough to impact a security price has not been a necessary condition for substantiating materiality. Plaintiffs often have not used security returns to satisfy

15. See Donald C. Langevoort, *Investment Analysts and the Law of Insider Trading*, 76 Va. L. Rev. 1023 (1990), for an extended discussion of materiality in SEC insider trading cases.
16. TSC Indus., Inc. v. Northway, Inc., 426 U.S. 438, 450 (1976).
17. Arnold S. Jacobs, Litigation and Practice Under Rule 10b-5 § 61.02[b][iii] (1993).
18. Basic, Inc. v. Levinson, 485 U.S. 224, 231 (1988) (quoting *TSC Indus.*, 426 U.S. at 449).
19. *See id.* at 238.
20. *Id.* at 239 n.16
21. *Id.*
22. Jacobs, *supra* note 17, § 61.02[b][iii].
23. 401 F.2d 833 (2d Cir. 1968), *cert. denied*, 394 U.S. 976 (1969).
24. *Id.* at 848 (quoting Arthur Fleischer Jr., *Securities Trading and Corporate Information Practices: The Implications of the Texas Gulf Sulphur Proceeding*, 51 Va. L. Rev. 1271, 1289 (1965)).
25. Basic, Inc. v. Levinson, 485 U.S. 224, 238-39, 250 (1988).
26. *Texas Gulf Sulphur*, 401 F.2d at 849-50.
27. *See, e.g.*, Jacobs, *supra* note 17, § 61.02[b][iii].
28. 638 F. Supp. 596 (S.D.N.Y. 1986).
29. *Id.* at 623.

the materiality requirement without examining security returns associated with the release of the information.[29]

The SEC recently began to use stock price evidence to show materiality in securities fraud cases, especially insider trading cases. The SEC applied financial economics using evidence derived from economic theory and prior empirical research in addition to information from the actual case. First, economic theory and prior empirical research suggest the expected stock price reaction to the release of information for the event in question. For example, if the case involves suspected insider trading prior to an earnings announcement, a determination is made as to the expected stock price movement based on evidence accumulated from prior similar earnings announcements. The second component in using financial economics to evaluate the materiality of information is an examination of the stock price movement associated with the release of information for the case in question. A price change consistent with theory and prior evidence bolsters the establishment of materiality; and the larger the price movement, the more likely the information is material. Financial economics analysis is especially applicable for cases where the stock-price movement attributable to the release of information is relatively small, or where the stock exhibits high volatility.

DISGORGEMENT

The other potential application of financial economics in SEC enforcement actions involves disgorgement calculations.[31] Disgorgement requires defendants to " 'give up the amount by which [they were] unjustly enriched.' "[32] Thus, disgorgement depends on the profits the defendant made from his or her fraudulent conduct, not the victims' losses. Additionally, the Insider Trading Sanctions Act of 1984[33] allows for punitive penalties up to three times the amount of disgorgement.[34] The application of financial economics is especially relevant because the implication drawn

30. *See, e.g.*, JACOBS, *supra* note 17, § 61.04.

31. For additional discussion of disgorgement in SEC cases, see MICHAEL J. KAUFMAN, SECURITIES LITIGATION: DAMAGES (1992 & Supp. 1993) and Thomas C. Mira, *The Measure of Disgorgement in SEC Enforcement Actions Against Inside Traders Under Rule 10b-5*, 34 CATH. U.L. REV. 445 (1985).

32. SEC v. Tome, 833 F.2d 1086, 1096 (2d Cir. 1987) (quoting SEC v. Commonwealth Chem. Sec. Inc., 574 F.2d 90, 102 (2d Cir. 1978)), *cert. denied sub nom.* Lombardfin S.p.A. v. SEC, 486 U.S. 1014 (1988).

33. Pub. L. No. 98-376, 98 Stat. 1264 (codified in scattered sections of 15 U.S.C.).

34. 15 U.S.C. § 78u-1(a)(2) (1988). For cases that were influential in establishing the method of calculating disgorgement damages, see *infra* text accompanying notes 35-84. This Article does not address specifically the issue of calculating damages in private actions. The methodology presented in this Article, however, can be applied easily to such suits. *See generally* Bradford Cornell & R. Gregory Morgan, *Using Finance Theory to Measure Damages in Fraud on the Market*, 37 UCLA L. REV. 883 (1990) (discussing *Basic* and the out-of-pocket measure).

from the efficient markets hypothesis that security prices reac[t] [qui]ckly to the release of new information reduces the subjectivity in estimating profits from fraud.

Securities Fraud Disgorgement Cases

The courts first expanded the SEC's remedies for insider trading violations of rule 10b-5 beyond injunctions to include disgorgement in the *Texas Gulf Sulphur* cases during the late 1960s and early 1970s.[35] In *SEC v. Texas Gulf Sulphur Co.*,[36] the defendants, officers and employees of Texas Gulf Sulphur, purchased Texas Gulf Sulphur stock and call options a few days before the public announcement of a major ore discovery on April 16, 1964. The district court accepted the SEC's argument that the defendants be required to disgorge profits based on the difference between the price they paid for the stock and the closing stock price the day after the public announcement of the ore strike.[37] The court noted that by the day after the public announcement, "[t]he news was widely disseminated by the news media and was available to the investing public."[38] In subsequent private suits arising from the insider trading, the court required disgorgement based on the average of the highest prices for each of the twenty days after the public announcement.[39] In all cases, most of the defendants sold shortly after the announcement, so there was little difference between paper and actual profits.[40]

In the second major SEC disgorgement case, *SEC v. Shapiro*,[41] the defendant, Norman Berman worked for a merger boutique. In January and February 1971, Berman purchased 1100 shares of Harvey's Stores stock at prices ranging from $7.25 to $23.75 while negotiating a merger between Harvey's Stores and Ridge Manor. On February 18, 1971, Harvey's announced an agreement in principle to merge with Ridge Manor—its stock price closed at $24. A few days later, the proposed merger unravelled and Harvey's stock price declined. Berman subsequently sold his stock at prices ranging from $21 to $22 a share.

The district court held that Berman violated the insider trading laws by exploiting material, nonpublic information regarding the proposed

35. Several cases arose as a result of insider trading in Texas Gulf Sulphur stock. The most famous case is SEC v. Texas Gulf Sulphur, Co., 401 F.2d 833 (2d Cir. 1968), *cert. denied*, 394 U.S. 976 (1969).

36. 312 F. Supp. 77 (S.D.N.Y. 1970), *aff'd in part, rev'd in part*, 446 F.2d 1301 (2d Cir.), *cert. denied*, 404 U.S. 1005 (1971).

37. *Id.* at 93-94.

38. *Id.* at 93.

39. Reynolds v. Texas Gulf Sulphur, 309 F. Supp. 548, 563 (D. Utah 1970), *aff'd in part, rev'd in part sub nom.* Mitchell v. Texas Gulf Sulphur, 446 F.2d 90 (10th Cir.), *cert. denied*, 404 U.S. 1004 (1971).

40. *Id.* at 558-62.

41. 494 F.2d 1301 (2d Cir. 1974).

merger.[42] The court required Berman to disgorge his paper profits based on the average price, $23.80, of all transactions on February 18, the date of the public announcement of the tentative merger agreement, on the basis that he could have sold his stock at that price.[43] The Second Circuit explained that "[o]nce public disclosure is made and all investors are trading on an equal footing, the violator should take the risks of the market himself."[44]

While the courts applied paper profits in the *Texas Gulf Sulphur* cases and *Shapiro*, the SEC argued in favor of actual profits in a subsequent, influential insider trading case—*SEC v. MacDonald*.[45] The defendant, James E. MacDonald, purchased stock in Realty Income Trust (RIT) based on information regarding a pending acquisition and lease agreement. MacDonald, chairman of the board of trustees of RIT, learned of the agreement on December 15, 1975 at a board meeting and then purchased 100 shares at $4.25 the following day[46] and 9500 shares at $4.625 on December 23. On December 24, RIT issued a press release detailing the acquisition and lease agreement, disseminated by Dow Jones News Service and Reuters, and the stock price increased 19% to $5.50. RIT's stock price steadily increased after the announcement for several days, and by the end of the next month the price climbed to $7.125.[47] Figure 1 displays the daily closing price for RIT from one week before MacDonald's trades, December 8, 1975, through January 29, 1976.

MacDonald did not sell his shares immediately after the announcement; instead he waited more than a year before selling at roughly $10 a share. The SEC argued that MacDonald should disgorge his actual profits.[48] While the district court accepted the SEC's argument,[49] the United States Court of Appeals for the First Circuit reversed the disgorgement decision holding that disgorgement should only be the amount of profit attributable to the inside information.[50] The First Circuit stated that profit should be based on the difference between the purchase price and the price "a reasonable time after the inside information had been generally disseminated."[51] Moreover, "the court should consider the volume and price at which RIT shares were traded following disclosure, insofar as they suggested the date by which the news had been fully digested and acted upon by in ... s."[52] The case then was remanded to the district court to determine a reasonable time.[53]

Upon remand, the district court used the price movement of RIT stock as evidence of full assimilation of the information.[54] The district court stated that the market did not fully digest the news immediately because the price continued to rise for several days after the December 24 announcement.[55] The court held that the price stabilized on January 13 and used the average price of $6.50 on that day for disgorgement.[56] Thus, the court of appeals and the district court on remand did not follow exactly the approach of the courts in *Texas Gulf Sulphur* and *Shapiro*—the full information price was the closing price on the day after the public release of the information—claiming the information in *MacDonald* was "considerably less spectacular"[57] than the *Texas Gulf Sulphur* ore strike.[58] Additionally, the district court recognized that part of the price increase subsequent to the lease-agreement announcement corresponded to a favorable *Wall Street Journal* story on December 31, 1975 regarding the sale of properties by RIT.[59] While the district court held that the *Wall Street Journal* story brought creditability to the press release,[60] the *Wall Street Journal* story did not pertain to the lease agreement announcement that was the basis of the insider trading.[61] MacDonald therefore appealed the finding of the district court and argued that the *Wall Street Journal* article was "an intervening, superseding, cause of the RIT stock price surge in early 1976."[62] The court of appeals affirmed the judgment of the district court,[63] saying it was "unable to conclude that the district court committed clear error in rejecting defendant's argument."[64]

The *MacDonald* decision is an important precedent for determining SEC disgorgement calculation. First, the court of appeals in *MacDonald* reversed the lower court's method of profit calculation and recommended paper profits as in *Texas Gulf Sulphur* and *Shapiro*, strengthening the use of paper

42. SEC v. Shapiro, 349 F. Supp. 46, 54-55 (S.D.N.Y. 1972), *aff'd*, 494 F.2d 1301 (2d Cir. 1974).
43. *Id.* at 56.
44. *Shapiro*, 494 F.2d at 1309.
45. 699 F.2d 47 (1st Cir. 1983).
46. MacDonald placed a limit order to buy up to 20,000 shares at $4.25 but only 100 shares were available at this price.
47. *See infra* Figure 1.
48. *MacDonald*, 699 F.2d at 52.
49. *SEC v. MacDonald*, Litigation Release No. 0073, [1981 Transfer Binder] Fed. Sec. L. Rep. (CCH) ¶ 98,009 (D.R.I. Apr. 23, 1981).
50. *MacDonald*, 699 F.2d at 55.
51. *Id.*
52. *Id.*
53. *Id.*
54. SEC v. MacDonald, 568 F. Supp. 111 (D.R.I. 1983), *aff'd*, 725 F.2d 9 (1st Cir. 1984).
55. *Id.* at 113.
56. *Id.* at 112.
57. *MacDonald*, 699 F.2d at 54.
58. *Id.*; *MacDonald*, 568 F. Supp. at 114 n.5.
59. *MacDonald*, 568 F. Supp. at 112 n.1. The *Wall Street Journal* reported that a Boston firm planned to buy 15 of RIT's properties. During the three-day period surrounding the announcement, RIT's stock price increased from $5.25 to $5.875. *See Realty Income Trust Says Boston Group Bids for 15 Properties*, WALL ST. J., Dec. 31, 1975, at 8.
60. *MacDonald*, 568 F. Supp. at 113.
61. SEC v. MacDonald, 725 F.2d 9, 11 (1st Cir. 1984).
62. *Id.*
63. *Id.* at 10.
64. *Id.* at 11.

profits over actual profits.[65] Second, the *MacDonald* decision held that a reasonable time must take place after the public release of information and before complete dissemination occurs.[66] Because the court of appeals held that the pattern of the price and volume movements after the announcements should be considered in determining a reasonable time period,[67] the SEC and the courts have had leeway in determining when a "reasonable time" has taken place.

MacDonald also illustrates that the use of financial economics analysis reduces the ambiguity in determining the reasonable time period. For example, financial economic analysis could have been applied to show that the price increase around the unrelated *Wall Street Journal* article was specific to the information in that article and not at all to the information that MacDonald used in his trading. Further, while the courts and the SEC held that the price increases that continued until January 13 were related to the inside information,[68] it so happens that the overall stock market increased substantially over this period.[69] To the extent that RIT's stock price moved with the overall stock market, part of the increase in the price of RIT over this period could have been due to general economic conditions.

Disgorgement in Schedule 13D Violations

Historically, the SEC confined disgorgement to insider trading cases. Recently, however, the SEC has obtained disgorgement for other violations such as delinquent Schedule 13D filings. The SEC requires that purchasers of more than five percent of the stock of a publicly traded company file a Schedule 13D within ten business days after crossing the five percent threshold.[70] If the holder is intent on acquisition, the Schedule 13D provides information about the acquisition group including a list of its members and the group's intentions for the target company.[71] The SEC also requires the holder to file amendments to Schedule 13D after the occurrence of material changes in the information contained in the original filing.[72]

65. SEC v. MacDonald, 699 F.2d at 47, 55 (1st Cir. 1983).
66. *Id.* at 53-54.
67. *Id.* at 55.
68. *MacDonald*, 568 F. Supp. at 113.
69. *See infra* Figure 1.
70. 17 C.F.R. § 240.13d-1(a) (1993); *see also id.* § 240.13d-101. Schedule 13D implements section 13(d) of the Exchange Act, 15 U.S.C. § 78m(d) (1988).
71. 17 C.F.R. § 240.13d-101.
72. *Id.* § 240.13d-2(a).

Stock prices rise in response to Schedule 13D filings.[73] Therefore, shareholders who file a Schedule 13D later than required may be able to purchase shares subsequent to their Schedule 13D, triggering purchase at prices lower than they would have paid otherwise. This means that filing a delinquent Schedule 13D can lead to extraordinary profits that are subject to disgorgement. The SEC first sought and obtained disgorgement for an improper Schedule 13D filing in 1988 in *SEC v. First City Financial Corp.*[74] During February and March of 1986, First City Financial Corp. (First City), controlled by the Belzberg family, purchased over nine percent of the stock of Ashland Oil Company (Ashland). On March 25, 1986, First City announced its stake in Ashland. The next day, First City proposed a merger in a letter to Ashland and filed a Schedule 13D with the SEC detailing its ownership. Ashland responded to the proposal the following week by announcing the repurchase of the stake from First City.

The SEC alleged that First City and its vice president, Marc Belzberg, violated section 13(d) of the Exchange Act by filing the Schedule 13D later than required.[75] As of February 28, First City held 4.9% of Ashland stock. According to the SEC, on March 4 Bear Stearns purchased a large block of shares on behalf of First City through a put and call agreement.[76] The SEC claimed that this purchase gave First City beneficial ownership of the shares held by Bear Stearns and hence First City should have filed the Schedule 13D by March 17 rather than on March 26.[77] Thus, the SEC argued that First City purchased Ashland stock from March 17 to March 26 at prices that did not incorporate properly the impact of crossing the five percent threshold.[78]

The SEC sought disgorgement of approximately $2.7 million, reflecting the difference between the price paid by First City for 890,100 shares purchased between March 17 and March 26 (average purchase price of $48 a share) and the price at which Ashland repurchased the shares from First City on April 2 ($51 a share).[79] The court approved the SEC's dis-

73. *See* Wayne H. Mikkelson & Richard S. Ruback, *An Empirical Analysis of the Interfirm Equity Investment Process*, 14 J. Fin. Econ. 523 (1985); Clifford G. Holderness & Dennis P. Sheehan, *Raiders or Saviors? The Evidence on Six Controversial Investors*, 14 J. Fin. Econ. 555 (1985).
74. 890 F.2d 1215 (D.C. Cir. 1989).
75. *Id.* at 1223.
76. *Id.* at 1219. Under a put and call agreement, a broker buys stock for its own account with the understanding that its client, the investor, can purchase the stock from the broker at a set price, plus interest and commissions. To protect itself from market risks, the broker has the right to put the stock to the investor at the same price. In *First City*, the defendants argued that a misunderstanding occurred between Bear Stearns and First City in that First City merely meant to tell Bear Stearns that buying Ashland stock would be a good investment, not to buy and hold the stock for it. *See id.* at 1217-20.
77. *Id.* at 1220-23.
78. *Id.* at 1223-24.
79. *Id.* at 1230.

gorgement estimate, noting that the precise measure of ill-gotten gains was not actual profits but that "disgorgement need only be a reasonable approximation of profits causally connected to the violation."[80]

In *First City*, the court explicitly chose not to use financial economics to estimate the savings to the defendants of a late Schedule 13D filing, stating that "[d]espite sophisticated econometric modelling, predicting stock market responses to alternative variables is, as the district court found, at best speculative."[81] Moreover, the court rejected the testimony of an expert witness employing financial economics who argued that factors in addition to the Schedule 13D filing contributed to the price increase during that period.[82]

Disgorgement and Financial Economics

Financial economics analysis can be quite useful in estimating the amount of profits a wrongdoer must disgorge. When disgorgement is used as a penalty, the defendant must disgorge the profits realized from his or her fraudulent conduct. Financial economics can be used to provide unbiased estimates of these profits. This methodology is especially useful when the actual profits realized from the securities transactions do not equal the profits directly attributable to the fraudulent actions. To date, this analysis has not been used universally for disgorgement calculation, in part because it may appear complicated to the courts. As the court of appeals in *SEC v. First City Financial Corp.*[83] said, "[i]f exact information were obtainable at negligible cost, we would not hesitate to impose upon the government a strict burden to produce that data to measure the precise amount of the ill-gotten gains."[84] Despite these concerns, financial economics can play an important role in calculating disgorgement.

EVENT STUDY METHODOLOGY

An event study is a statistical technique that estimates the stock price impact of occurrences such as mergers, earnings announcements, and so forth.[85] The basic notion is to disentangle the effects of two types of information on stock prices—information that is specific to the firm under

80. *Id.* at 1231.
81. *Id.*
82. *Id.* at 1232.
83. 890 F.2d 1215 (D.C. Cir. 1989).
84. *Id.* at 1231.
85. *See generally* Cynthia Campbell & Charles Wasley, *Measuring Security Price Performance Using Daily NASDAQ Returns*, 33 J. FIN. ECON. 73 (1993); LAURENTIUS MARAIS & KATHERINE SCHIPPER, APPLICATION AND EVENT STUDY METHODS IN LITIGATION SUPPORT (1992); Glenn V. Henderson, Jr., *Problems and Solutions in Conducting Event Studies*, 57 J. RISK & INS. 282 (1990); Pamela P. Peterson, *Event Studies: A Review of Issues and Methodology*, 28 Q. J. BUS. & ECON. 36 (1989); Stephen J. Brown & Jerold B. Warner, *Using Daily Stock Returns: The Case of Event Studies*, 14 J. FIN. ECON. 3 (1985).

question (e.g., dividend announcement) and information that is likely to affect stock prices marketwide (e.g., change in interest rates). Eugene F. Fama, Lawrence Fisher, Michael Jensen and Richard Roll from the University of Chicago were the first researchers to apply this methodology. Their seminal work examined the stock price reaction to stock splits and subsequently was published by the *International Economic Review* in 1969.[86]

Event study methodology has its foundation in the efficient markets hypothesis. This well-known hypothesis states that security prices reflect all available information.[87] While theoreticians have developed various definitions of this basic statement, for event studies the relevant definition is that stock prices reflect all publicly available information. Numerous event studies in the academic finance, accounting, economics, marketing, and legal literatures incorporated the idea that if stock prices reflect all public information, price changes around public announcements is due generally to the arrival of new information stemming from that announcement. Consistent with the efficient markets hypothesis, studies have shown that stock prices react quickly to the arrival of new information, often within a matter of seconds.[88]

The execution of an event study is quite simple. It involves the identification of an event that causes investors to change their expectations about the value of a firm. The investigator compares a stock price movement contemporaneous with the event to the expected stock price movement if the event had not taken place. There are three basic steps in conducting an event study: (i) define the event window; (ii) calculate abnormal stock

86. Eugene F. Fama et al., *The Adjustment of Stock Prices to New Information*, 10 INT'L ECON. REV. 1 (1969).

87. *See* Eugene F. Fama, *Efficient Capital Markets: A Review of Theory and Empirical Work*, 25 J. FINANCE 385 (1970) and Fama, *supra* note 1, for reviews of the literature on the efficient markets hypothesis. From time to time, the efficient markets hypothesis comes under intense criticism. For example, in the aftermath of the stock market crash of 1987, many commentators suggested that the crash invalidated the efficient markets hypothesis. For the most part, however, this hypothesis withstood such criticism and continues to be the most viable theory offered. In fact, two studies reconcile the stock market crash with the efficient markets hypothesis. *See* Mark L. Mitchell & Jeffry M. Netter, *Triggering the 1987 Stock Market Crash: Antitakeover Provisions in the Proposed House Ways and Means Tax Bill?*, 24 J. FIN. ECON. 37 (1989) and Charles J. Jacklin et al., *Underestimation of Portfolio Insurance and the Crash of October 1987*, 5 REV. FIN. STUD. 35 (1992). More importantly, with respect to event studies described herein, even critics of the efficient markets hypothesis concur that the efficient markets hypothesis is relevant. *See* Lawrence H. Summers, *Does the Stock Market Rationally Reflect Fundamental Values?*, 41 J. FINANCE 591, 596 (1986). This is because, as Fama points out, there is little debate that individual firm's stock prices respond quickly to the release of new information about that firm. *See* Fama, *supra* note 1, at 1601. The debate about the efficient markets hypothesis is more concerned with the determinants of overall market fluctuations.

88. *See generally* James M. Patell & Mark Wolfson, *The Intraday Speed of Adjustment of Stock Prices to Earnings and Dividend Announcements*, 13 J. FIN. ECON. 223 (1984); Larry Y. Dann et al., *Trading Rules, Large Blocks, and the Speed of Price Adjustment*, 4 J. FIN. ECON. 3 (1977).

price performance around the event; and (iii) test for statistical significance of the abnormal stock price performance.

DEFINING THE EVENT WINDOW

The first step in the event study is selecting an event window. The event window is the period when information about the event becomes available to the stock market and thus may affect the relevant company's stock price. For most publicly-traded corporations, the event is disseminated publicly by newswire sources such as Dow Jones & Company and Reuters. In the case of Dow Jones & Company, the news is distributed via the *Dow Jones Broadtape* immediately after receipt of the news release from the corporation or government agency. For the relatively important news releases, Dow Jones also reports the event in the *Wall Street Journal* on the next business day.[89]

The efficient markets hypothesis is influential in determining the length of the event window. Because the efficient markets hypothesis, supported by considerable empirical evidence, suggests that stock prices react quickly to the release of new information, in many cases the event window will be relatively short, sometimes as short as one trading day. In determining the length of an event window, an important tradeoff exists. The longer the event window, the more likely the window includes the period during which all the new information about the event is released. The tradeoff, however, is that long event windows may include noise and information from other events, making it difficult to isolate the impact of the relevant event.

The extent of the difficulty in defining the event window length varies across events. In those instances where the release of new information is a complete surprise to the market, it is relatively easy to establish the beginning of the event period. Consider an airline crash, for example.[90] Because airline crashes are unanticipated, the first day of the event period is either the day of the crash or the subsequent trading day if the crash occurred after the market close.[91] Even when it is easy to identify the beginning of the event window, it can be difficult to establish the end of the event window. In the airline example, the end of the period would depend on when all of the relevant information regarding the crash was made available to market participants.[92] For some crashes, it may take several days or perhaps even weeks before the market recei[ves] the relevant information; in these cases, a longer event window is more necessary than for a crash in which all information is available within a few hours following the crash.[93] In most cases, however, the bulk of the information is released at the announcement of the event. Because the market processes information rapidly, it is conventional to expand the window only a short period after the announcement. The current academic standard is to extend the event period to the close of trading on the day after the release of the pertinent information.[94]

For those events that are subject to leakage, defining the beginning of the event window can be problematic. Consider the case of a merger in which the target company is rumored to be "in play" prior to the announcement.[95] For such a case, the event window should begin prior to the actual merger announcement, perhaps as long as a week or two. Ideally, the first day of the event window corresponding to a merger would be the date on which investors began trading on news about the upcoming merger, regardless of whether the news was based on rumors, inside information, a Schedule 13D filing, or a public announcement that merger talks were in process. In practice, this date is difficult to define and some degree of judgment is required generally based on price and volume movements prior to the merger announcement.

With respect to securities fraud cases, there is substantial variation in the complexity of determining the length of an event window. In some fraud cases, choosing the appropriate event window is straightforward. An example is an insider trading case where the information used by the investor is revealed subsequently in a single public announcement. On the other hand, in many securities fraud cases the relevant information is revealed slowly over time, while during the same period investors receive other, sometimes unrelated, information about the firm(s) in question. In the latter case, it is relatively difficult to choose an appropriate window. The main advice is to carefully identify the exact dates during which the information in question reached the market, and then restrict the window to a short period if possible, generally two or three days around each release of new information.

89. For information regarding news releases sent to Dow Jones & Company and their subsequent dissemination and impact upon the stock market, see Mark L. Mitchell & J. Harold Mulherin, *The Impact of Public Information on the Stock Market* (1993) (unpublished manuscript, on file with *The Business Lawyer*, University of Maryland School of Law) and Robert Thompson et al., *Attributes of News About Firms: An Analysis of Firm Specific News Reported in the Wall Street Journal Index*, 25 J. FINANCE 245 (1987).

90. *See* Mark L. Mitchell & Michael Maloney, *Crisis in the Cockpit? The Role of Market Forces in Promoting Air Travel Safety*, 32 J. LAW & ECON. 329 (1989).

91. *Id.* at 340.

92. *Id.*

93. *Id.*

94. This is particularly true when the researcher examines a sample of several occurrences of the same type event such as a merger announcement. For a single event that is generally the norm in a securities fraud case, depending upon market factors, the window often can extend beyond the close of trading the day after the public announcement.

95. See Gregg A. Jarrell & Annette B. Poulsen, *The Returns to Acquiring Firms in Tender Offers: Evidence From Three Decades*, 18 FIN. MGMT. 12 (1989) and Lisa K. Meulbroek, *An Empirical Analysis of Illegal Insider Trading*, 47 J. FINANCE 1661 (1992), for a discussion of stock price movements prior to major events. Gregg Jarrell and Annette Poulsen document evidence of substantial stock-price run-up in target firms prior to takeover announcements. Lisa Meulbroek shows that insider trading often accounts for a large part of this stock price run-up.

05/07/97 WED 13:30 FAX 914 448 4041 NERA 010

CALCULATE ABNORMAL STOCK PRICE PERFORMANCE

The next step in the event study is to examine the stock price performance around the event. The goal is to isolate the effect of the event on the contemporaneous stock price movement. Stated differently, the investigator attempts to determine whether the stock price behavior around the event is abnormal. A large abnormal stock price movement occurring at the same time the market receives news about an event suggests that the event caused the abnormal price movement. Furthermore, the link between the event and the price movement is even stronger if there is no other new information reaching the market at the same time that could affect the stock price.

The simplest way to evaluate abnormal stock price performance is to visually examine the stock price movement around the event and assess whether it appears small or large. Of course, the degree to which the stock price movement is small or large depends not only on the absolute value of the movement but also on the movement relative to historical patterns and to contemporaneous overall market movements.

Calculation of Stock Returns

In finance terminology, the change in a stock price over a given period is known as the stock price return. The return is expressed as:

$$r = [(P_1 - P_o) + DIV_1]/P_o$$

where

P_1 = price at end of period
P_o = price at beginning of period
DIV_1 = dividend paid during period.

Thus, the return is simply the change in the stock price during the period plus any payout of dividends during the period, relative to the stock price at the beginning of the period.[96] This discussion focuses on daily stock price returns, which is the standard time interval used in most eve dies, although returns can be calculated over any increment of time such as hours or months. In securities fraud litigation, daily stock price returns are typically the appropriate measure. In some cases, an examination of hourly, weekly, or monthly data may be warranted—in such cases, the methodology as described can be applied similarly.

An example of a major event to examine abnormal stock market performance is the Tylenol poisonings of 1982.[97] On September 30, 1982, Johnson & Johnson, the maker of Tylenol, announced that three people died as the result of ingesting cyanide-laced Tylenol capsules.[98] Four more deaths were reported within the next two days.[99] The Tylenol poisonings resulted in 125,000 stories in the print media alone—an event unprecedented in American business.

To the extent that investors expected the Tylenol poisonings to reduce future cash flows to the stockholders of Johnson & Johnson, its stock price should have declined in response to the announcement of the poisonings. According to the efficient markets hypothesis, the stock price decline will occur quickly. Correspondingly, the return to Johnson & Johnson stock on September 30, 1982, the day that Johnson & Johnson revealed the Tylenol poisonings, is:

$$-6.50\% = [\$46.125 - \$43.125]/\$46.125$$

where \$46.125 and \$43.125 are the closing prices on September 29 and 30, respectively.

Calculation of Standard Deviation

A decline of 6.50% on a given day appears quite large, especially for a blue-chip firm such as Johnson & Johnson. It is necessary to perform statistical tests, however, to determine that the 6.50% decline did not occur by chance. One approach is to compare the return to a series of returns over some prior period. The comparison period typically ranges from 100 to 300 trading days. For the Johnson & Johnson example, the trading days for the one-year period ending on September 29, 1982, the day before the public announcement of the poisonings, are used. There are 253 trading days during this period. Interestingly, for only one day during the prior year did Johnson & Johnson's stock move more in absolute value than on September 30, 1982. That day is August 17, 1982 when Johnson & Johnson's stock price increased 7.19%. It so happens that this large positive return is likely due in part to the overall stock market increase of

96. Researchers often express returns in logarithmic form as

$$r = \text{natural logarithm}[1 + [(P_1 - P_o) + DIV_1]/P_o]$$

or as

$$r = \text{natural logarithm}[(P_1 + DIV_1)/P_o].$$

The logarithmic return is a continuously compounded return whereas the return described in the text is a simple return. For practical purposes the distinction between these two return measures is relatively minor. One benefit of the logarithmic return method is that in statistical terminology, the transformation makes the distribution of the returns closer to a normal distribution, thus improving the validity of statistical testing. For ease of exposition, the simple return measure is focussed upon. Further, it is also the case that the simple return measure provides better estimates for disgorgement purposes.

97. *See* Mark L. Mitchell, *The Impact of External Parties on Brand-Name Capital: The 1982 Tylenol Poisonings and Subsequent Cases*, 27 ECON. INQUIRY 601 (1989).

98. *Id.* at 601.

99. *Id.*

4.35% that day.[100] The fact that there is only one return during the ... one-year period that is of the magnitude of the September 30, 1982 decline suggests this decline is significant.

To assess the significance of the −6.50% return on September 30, 1982, a well-known metric of variation in statistics is relied on, the standard deviation. This metric measures the dispersion in a variable around its mean value. The standard deviation for stock returns is formally expressed as:

$$s = \frac{\sqrt{\Sigma (r_i - \bar{r})^2}}{N - 1}$$

where $\bar{r}$ is the mean return over the sample period and N is the number of trading days in the sample period. As the formula indicates, the greater the variation around the mean value in the sample, the larger the standard deviation. Suppose for example that all the returns had the same value. In such a case, there would be no dispersion around the mean value and thus the formula would indicate a value of zero. Note that the term $(r_i - \bar{r})$ is squared—the rationale is the magnitude of the deviation of returns from the mean value is what matters, not whether a return is above or below the mean. The division by N − 1 adjusts for the number of returns in the sample. The intuition behind the N − 1 term is straightforward. If this divisor were not included, the calculated standard deviation would increase in magnitude as the number of returns increased. Thus, the numerator keeps track of total deviations while the denominator keeps track of the number of deviations. In this light, the ratio represents an average deviation between an observation and its mean.

The standard deviation of the daily return for Johnson & Johnson stock during the 253 trading days period prior to the Tylenol poisonings is 1.84%. What can be inferred about the impact of the Tylenol poisonings on Johnson & Johnson's stock price when there was a −6.50% return on September 30, 1982 and the historical daily mean return and standard deviation of Johnson & Johnson's stock is known? The most common way to analyze this question is to consider the statistical significance of the daily return.

Testing the Statistical Significance of a Stock Return

Once a researcher identified an event window and calculated the return during that event window, he or she then can determine the statistical significance of the return. The question is whether the absolute value of the return is large enough so that the researcher can indicate with confidence that the return is relatively unusual. The importance of the historical average and standard deviation of the daily returns is hi... ted in making the assertion that a given daily return is different from the typical daily return. There is an additional consideration in this analysis—the role of the normal distribution.

Many statistical texts rely on the assumption that the data of interest is normally distributed. The normal distribution is attractive because it is a good description of a wide variety of random variables including stock returns. In the normal distribution, the values of the variable are distributed symmetrically around the mean value and are not concentrated around extreme values. A normal distribution has the familiar bell-shape.[101] Also important is that a variable that is distributed normally can be described by its mean and standard deviation. For example, for a normally distributed random variable, the probability is 68.3% that a randomly selected value will lie within one standard deviation of the mean value. Similarly, the probability is 95.5% that a randomly selected value will lie within two standard deviations of the mean value. Expressed differently, there is only a 4.5% chance that a randomly selected observation will not fall within two standard deviations of the mean value. Finally, very few observations fall outside the boundary of three standard deviations from the mean value—the probability is 99.7% that a randomly selected observation will lie within three standard deviations of the mean value.

While visual displays of stock returns suggest returns tend to follow a bell-shaped distribution, prior statistical research indicates that they are not distributed precisely normally.[102] Even so, researchers have shown that the normal distribution is an appropriate approximation for event study analyses.[103] Throughout the remainder of this Article, it is assumed that stock returns actually adhere to the normal distribution so that appropriate hypothesis tests can be constructed to determine whether stock price movements during event windows are statistically significant.

To calculate probability values, the normal distribution must be transformed into the standard normal distribution. A standard normal distribution has a mean value of zero and a standard deviation of one. One can calculate z-statistics with this standard distribution—the z-statistic is expressed as:

$$z\text{-statistic} = (\text{observed value} - \text{mean value})/\text{standard deviation}.$$

Most standard statistics texts include a table of the cumulative standard normal distribution.[104] The table reports for various values of the z-statistic

100. For discussion of controlling for general market movements, see *infra* text accompanying notes 106-115.

101. *See generally* LYMAN OTT, AN INTRODUCTION TO STATISTICAL METHODS AND DATA ANALYSIS (3d ed. 1988).

102. *See* Eugene F. Fama, *The Behavior of Stock Market Prices*, 38 J. BUSINESS 34 (1965).

103. *See* Brown & Warner, *supra* note 85, for a detailed exploration of the distribution of stock returns. Stephen Brown and Jerold Warner state that "[t]he non-normality of daily returns has no obvious impact on event study methodologies." *Id.* at 25.

104. *See generally* OTT, *supra* note 101.

the probability that a z of that value or greater will occur. The re-
searcher usually will convert an observation drawn from a normal distri-
bution into a z-value in order to assess the significance of that value.

The methodology discussed in the previous paragraph is phrased more formally in terms of hypothesis testing. In general, a test of significance aims to answer the question of whether an observed difference is real or simply occurred by chance. In statistical tests, the researcher usually sets out a null hypothesis which states that an observed difference occurred by chance. If the null hypothesis is rejected because a test statistic (such as a z-statistic) is greater than a specified value, then it is unlikely the difference occurred by chance. This result often is called a finding of statistical significance.

For example, researchers apply decision rules to determine whether a given value is significantly different from the mean value. An often used convention is the five percent rule—values greater than or equal to 1.96 standard deviations from the mean value are considered significantly different from the typical value because there is only a five percent chance that a randomly selected value will be 1.96 or more standard deviations from the true mean. Thus, if the calculated z-statistic has an absolute value of 1.96 or greater, the observed value could be considered significant at the five percent level. The decision rule may be more stringent. For example, there is only about a one percent likelihood that a randomly selected value will lie outside 2.58 standard deviations or more from the average value. Thus, if the z-statistic is greater than or equal to 2.58, the observed value can be considered significant. A third commonly used decision rule is ten percent—here, the probability is ten percent that a randomly selected value will lie 1.65 standard deviations or more from the mean value. Generally, researchers use a decision rule based on one percent, five percent, or ten percent significance levels.

Stock returns provide a good example of a test of whether an observation is significantly different from the mean. In the case of daily stock returns, the mean daily return is very close to zero: the mean annual return on the stock market over the past thirty years was roughly twelve percent with a corresponding mean daily return of 0.045%. Because the daily return is so small, it is assumed that it is zero for statistical tests and thus a test of whether a daily stock return is different from the mean is just a test of whether a daily return is different from zero. Therefore, the z-statistic is simply the daily return divided by the standard deviation. If the z-statistic is 1.96 or greater (based on a decision rule of five percent), the results indicate the daily return is significantly different from the mean return.

In an article published in the *Virginia Law Review* in 1991,[105] the authors (with Jonathan R. Macey and Geoffrey P. Miller) provided guidelines as to the magnitudes of daily stock price returns that are statistically different from zero. For the stocks of the largest equity-value New York Stock Exchange (NYSE) listed firms, a stock price movement of 2.80% would be considered significantly different from zero at the five percent level. In contrast, for the smallest equity-value NASDAQ firms, the necessary price movement to be considered significant at the five percent level is 10.02%. Therefore, because stock price volatility varies widely across firms, inferences about the significance of a firm's stock returns are made with respect to a comparison with that stock's own return history.

Statistical tests of significance are useful both in establishing materiality and in calculating disgorgement. A finding that a stock return associated with the release of information is large enough that it is unlikely that the return occurred by chance is strong evidence that the information was important. Therefore, if that information was used allegedly in securities fraud, the finding that the associated stock return is large enough to be statistically significant implies the information is material. Furthermore, a finding of statistical significance for stock returns data used in calculations of disgorgement is an indication that the estimates are accurate.

For example, suppose a firm's stock price increases seven percent on the day that management releases a favorable earnings announcement. Suppose, also, that the prior day an insider of the firm purchased stock based on his or her knowledge of the forthcoming announcement. The insider subsequently is charged with illegal insider trading. A finding that the seven percent return on the earnings announcement day is statistically significant is strong empirical evidence that the news was important. Stated differently, it is unlikely that the seven percent increase in the stock price occurred by chance. Furthermore, in calculating profits for disgorgement based on the stock price increase on the announcement day, if the return is statistically significant, then a more credible argument can be made that the seven percent return represents the value of the defendant's inside information.

Returning to the Johnson & Johnson example, recall that the standard deviation during the year prior to the poisonings was 1.84%. Dividing the return to Johnson & Johnson stock of −6.50% by this standard deviation yields a z-statistic of 3.53. It is highly improbable that a randomly selected return from Johnson & Johnson's return history would yield a value that is more than 3.53 standard deviations away from zero. Thus, one can claim with a high degree of confidence that Johnson & Johnson's stock price decline on September 30, 1982 did not occur by chance and thus the decline is likely due to the public announcement of the Tylenol poisonings. It is preferable, however, to correct for overall market movements before calculating the significance of abnormal returns.

Net of Market Stock Price Performance

When the market receives new information about the future cash flows of a company, the stock price quickly moves to a new value reflecting the

105. Macey, *supra* note 8.

new information. Often the information is firm specific in nature, e.g., earnings announcements. In addition, stock prices of individual firms move in conjunction with overall stock market movements that are caused by changes in underlying economy-wide factors. Thus, it is important to account for these marketwide movements, especially during periods when the market is volatile. The best example is the fall of 1987 when market volatility was extremely high around the stock market crash.[106] The basic method for accounting for marketwide factors subtracts the marketwide return from the individual stock's return. This estimate is called the net-of-market return.

Several choices are available as proxies for a marketwide return. Two well known measures are the Dow Jones Industrial Average (DJIA) and the Standard & Poor's 500 Index (S&P 500). The DJIA is limited somewhat as a market index as it contains only thirty stocks and thus large movements in this index often can be driven by changes in just a few stocks. With the S&P 500, this problem is less severe. While the S&P 500 is an acceptable index to proxy for the overall market, this Article uses an even broader measure—an index based on all stocks on the NYSE, American Stock Exchange (ASE), and NASDAQ. This index comes from the Center for Research in Security Prices (CRSP) at the University of Chicago and is one of the more comprehensive indexes available. It should be restated, however, that the S&P 500 is an appropriate proxy as well. Because the correlation between these two indexes is close to one, similar results usually are obtained regardless of the choice of index.

On September 30, 1982 when Johnson & Johnson's stock price dropped 6.50%, the overall market, as proxied by the CRSP value-weighted NYSE, ASE, and NASDAQ index, dropped as well, declining 0.89%. Thus, the net-of-market to Johnson & Johnson stock was −5.61%. As a result, it can be argued that the overall market decline can account for some of the decline in Johnson & Johnson's stock price that day. Even so, the net-of-market return is still quite large. To put this net-of-market return in perspective, it was calculated for the prior 253 trading days. Over this one-year period, a net-of-market return of this magnitude never occurred. The closest in absolute value took place on March 9, 1982, when Johnson & Johnson's net-of-market return was 5.17%. This evidence provides additional support of the notion that the public announcement of the Tylenol poisonings caused a major revaluation of Johnson & Johnson stock. To test for statistical significance, the standard deviation of Johnson & Johnson's net-of-market return over the prior 253 trading day period is computed—this sample standard deviation is 1.42%.[107] Thus, the net-of-market return of −5.61% is highly statistically significant as it is roughly four standard deviations away from a mean return of zero. Stated differently, the z-statistic is 3.95, which is substantially greater than the z-statistic of 2.58 necessary for significance at the one percent level.

Beta-Adjusted Stock Market Performance

Although net-of-market returns, in many cases, provide an appropriate estimate of the stock price effects of new information, there are instances where computation of market-adjusted returns requires a more refined analysis to account for the fact that not all stocks are affected identically by economy-wide factors. That is, the stock returns of some firms move proportionately more than the market in reaction to economy-wide news; the stock returns for some firms track the overall market very closely; and the stock returns of other firms are relatively insensitive to marketwide patterns. The methodology for this adjustment is the market model and requires an estimation of the relation between the stock returns of the individual firm and the returns of the overall market index during a comparison period (also known as the estimation period) which typically precedes the event window. The performance of the firm's stock during the event window is then compared to the predicted performance during the event window. The predicted performance is based on the firm's stock price relationship with the market over the control period.

The first step is to estimate the market model:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \epsilon_{it}$$

which assumes that the return to a stock i at time t is a function of the market return, R_{mt}, plus a random error term, ϵ_{it}, that is uncorrelated with the market return. The market model decomposes the return on a stock into two parts, one part due to factors influencing the market and one part due to variables specifically related to the firm itself. The term β_i, often referred to as beta, measures the sensitivity of a firm's stock returns to overall market returns. Although on average the returns on stocks vary proportionately with the returns on the market index, the returns on individual stocks typically vary more or less than the returns on a market index. For example, a beta of 1.5 indicates that a stock's return typically increases (or decreases) fifteen percent when the market increases (or decreases) ten percent. Similarly, a beta of 0.6 means that a stock's return typically increases (or decreases) only six percent in conjunction with a ten percent market increase (or decrease). In sum, firms that are relatively

106. For examples of event studies that examined specific announcements during the October 1987 stock market crash, see Mitchell & Netter, *supra* note 87 and Jeffry M. Netter & Mark L. Mitchell, *Stock-Repurchase Announcements and Insider Transactions After the October 1987 Stock Market Crash*, 18 Fin. Mgmt. 84 (1989).

107. Note that the net-of-market daily return standard deviation of 1.42% is less than the standard deviation (1.84%) of Johnson & Johnson's actual returns over this period. This difference is attributed to the fact that the actual return incorporates marketwide as well as firm-specific factors, and thus is more volatile than the net-of-market return.

sensitive to market movements (e.g., airlines) typically have betas that are greater than one, highly diversified firms have betas that are close to one, and firms that are relatively insensitive to market movements (e.g., regulated utilities) have betas that are less than one.[108]

The market model is estimated with regression analysis. The estimation period for this market model equation typically ranges from 100 to 300 trading days preceding the event under study. That is, the researcher uses the estimates of α and β, and the movement of the market to predict how the stock price of the firm would have changed during the event period if there were no firm-specific information released during the event period. The difference between the predicted return and the actual return on a given date during the event window is known as the abnormal return. The abnormal return expressed as:

$$AR_{it} = r_{it} - (\hat{\alpha}_i + \hat{\beta}_i R_{mt})$$

measures the impact of the event on stock i at time t.

As an example, apply the market model to the Tylenol case. To calculate the abnormal return to Johnson & Johnson stock on September 30, 1982, first the market model for the 253 prior trading days is estimated. As in the computation of the net-of-market return, the overall stock market is proxied by the CRSP value-weighted index of NYSE, ASE, and NASDAQ stocks. The estimated beta for Johnson & Johnson for the one-year period prior to the crash was 1.29. A beta of 1.29 suggests that Johnson & Johnson's stock typically increased (or decreased) 12.9% when the overall market increased (or decreased) 10%. The intercept or alpha term is virtually zero as it is only 0.0975%.

The abnormal return on September 20, 1982 to Johnson & Johnson stock is

$$-5.46\% = -6.50\% - 0.0975\% - (1.29 \times -0.89\%),$$

where -6.50% is the actual return to Johnson & Johnson stock, 0.0975% is the estimate of alpha from the market model, 1.29 is Johnson & Johnson's beta estimate and -0.89% is the market return on September 30, 1982.[109] Notice the abnormal return of -5.46% is not as negative as the net-of-market return of -5.62%. The net-of-market return approach assumes beta is 1.0, whereas the estimated beta for Johnson & Johnson is 1.29. Thus, more of the decline in Johnson & Johnson's stock price on September 30 is accounted for by market factors when it is adj[illegible] with the estimated beta than when assuming beta is 1.0.[110]

As before, statistical tests are necessary to estimate the confidence that the abnormal return is different from zero. In computing the significance of the abnormal stock price performance using the actual return and the net-of-market return, those returns simply are compared to the standard deviations of the actual and the net-of-market returns over the prior 253 trading days, respectively. In computing the statistical significance of the abnormal returns, however, the significance tests are more complex than in the case of the net-of-market return, yet the intuition is still the same.[111] In this case, the researcher estimates the standard error of forecast[112] for the abnormal return as

$$s_{ar} = [s^2(1 + 1/N_e + (R_{mt} - \bar{R}_m)^2/CSSR_m)]^{1/2}$$

where s^2 is the estimated residual variance from the regression model for the estimation period, N_e is the number of trading days in the estimation period, $\bar{R}_m$ is the estimation period sample mean of the market return, and $CSSR_m$ is the corrected sum of squares of the market return during the event period. This measure is essentially the standard deviation of Johnson & Johnson's returns during the prior 253 trading days accounting for the relation of the returns with the stock market, plus terms to account for the number of observations in the estimation period and overall market deviations on the event date.[113] The estimated standard error of forecast for September 30, 1992 is 1.42%.

108. The term α (i.e., the intercept of the market model), also known as alpha, represents the mean return on the stock when the market return equals zero. Although over time and on average, alpha approximates zero for most companies, it can be significantly different from zero for different intervals.

109. There is a very slight rounding error in these calculations as the calculated abnormal returns are based on parameter estimates and stock returns using five decimal places instead of the two decimal places as indicated for exposition purposes throughout the text.

110. It should be noted that recent works, *see* Eugene F. Fama & Kenneth R. French, *The Cross-Section of Expected Stock Returns*, 47 J. FINANCE 427 (1992) and Eugene F. Fama & Kenneth R. French, *Common Risk Factors in the Returns on Stocks and Bonds*, 33 J. FIN. ECON. 3 (1993), suggest additional risk factors to the overall market, such as firm size and market/book equity, should be accounted for when calculating abnormal returns. Under certain conditions, in a securities fraud case in which the information is released over a long period of time, the additional factors may alter the calculation of the abnormal returns. In the Johnson & Johnson example and the cases that follow, however, the Fama and French multifactor model does not alter the results.

111. For recent articles that describe statistical tests in event studies, see Ekkehart Boehmer et al., *Event-Study Methodology Under Conditions of Event-Induced Variance*, 30 J. FIN. ECON. 253 (1991) and Imre Karafiath & David E. Spencer, *Statistical Inference in Multiperiod Event Studies*, 1 REV. QUANTITATIVE FIN. & ACCT. 353 (1991). *See also supra* note 85.

112. *See generally* JOHN JOHNSTON, ECONOMETRIC METHODS (1984).

113. The term s^2 (0.0002) is the estimated residual variance from the regression model. The square root of this term is 0.0141 or 1.41% and is simply the standard error of the regression model. Notice that this term is virtually identical to the standard deviation of the net-of-market returns over the estimation period. The major distinction is that the standard error from the regression model is a measure of the variation in Johnson & Johnson's return accounting for a more precise relation with the overall market. The first term in brackets is simply 1. The second term, $1/N_e$, accounts for the number of days in the estimation period. The longer the estimation period, the more precisely estimated the market model parameters. This term is generally very small as estimation periods typically range from 100 to 300 days. The third term accounts for large stock market movements on the event date. The larger

Similar to the prior statistical tests, the abnormal return is compared with the standard error of forecast to determine significance. The abnormal return of −5.46 is nearly four times greater than the standard error— the z-statistic is −3.85. This indicates that even after accounting for beta, Johnson & Johnson's stock price declined significantly on September 30, 1982, when Johnson & Johnson revealed that Tylenol was laced with cyanide.

Cumulative Abnormal Returns

As noted earlier, event windows can extend beyond one trading day. For these cases, the abnormal returns can be cumulated to create the cumulative abnormal return formally expressed as

$$CAR_T = \prod_{t=1}^{T} (1 + AR_t) - 1$$

where T is the length of the event window.[114] The CAR measures the total impact of the event on the firm. Generally, event studies report both the AR and CAR over the event window. For event windows where the information was released over several days, the CAR often is emphasized. Analogously, simple returns and net-of-market returns can be cumulated as well.

Again, the Tylenol example illustrates measuring abnormal performance over multiday periods. A ten-day event window is constructed, covering the period from September 30 through October 13, 1982. Table 1 reports cumulative measures of Johnson & Johnson's stock price performance over this ten-day period in Panels A-C respectively.[115] Panel A displays the actual returns performance, Panel B displays the net-of-market returns performance, and Panel C displays the abnormal returns performance.

the absolute value of the overall stock market movement on the event date, the larger this term, and hence the larger the standard error of forecast. Consider for example the market crash of 1987 when the overall stock market fell approximately 20%. An abnormal return of 4% on this day would be less significant than an abnormal return of 4% on a day when the market was flat. In general, the second two terms are very small. For example on September 30, the sum of the three terms in brackets was 1.008, resulting in a standard error of forecast of 1.42%.

114. Intuitively, cumulative abnormal returns would appear to be simply the sum of the abnormal returns over the event window (this actually would be the case for logarithmic returns). The problem with a simple summation of the abnormal returns is that the base in the calculation changes from day to day. Therefore, the sum of abnormal returns does not yield a holding period return. Note that the product of (1+AR) over the event period is used rather than simply summing the abnormal returns. To illustrate, consider a price movement from $4 to $5 (AR = 25%) on one day and then back to $4 (AR = −20%) the next day. Summing the abnormal returns would yield a value of 5%, yet the holding period return is zero. Taking the product of (1 + .25) and (1 + −0.20) yields the correct cumulative return of zero.

115. *See infra* Table 1.

To illustrate the cumulation technique, consider the actual re... s on September 30 and October 1 of −6.51% and 1.74%, respectively. The cumulative return is given by the product of (1 − 0.0651) × (1 + .017) − 1. Thus, the two-day cumulative return is −4.88%. This process continues throughout the length of the event window. As of the tenth day of the event window, October 13, the cumulative return to Johnson & Johnson stock is −8.94%. Also, as shown in Table 1, there is a z-statistic that corresponds to the cumulative return.[116] With respect to the cumulative return of −8.94% over the ten-day window, the z-statistic is 1.54. As this z-statistic is slightly less than 1.65, the −8.94% cumulative return misses statistical significance at the ten percent level.

The cumulative net-of-market returns in Panel B display strikingly divergent estimates from that of the cumulative return. Here, the cumulative net-of-market return on October 13, 1982 is −18.91%. The reason that the cumulative net-of-market return is considerably more negative than the cumulative return is that there were large overall stock market gains during this two-week period. That is, Johnson & Johnson's stock would have realized even a larger absolute decline in value had the market not increased during this event window. Similar results are revealed in Panel C which shows the cumulative abnormal returns, based on the market model estimates. In this case, the cumulative abnormal return is −22.39% by the tenth day following the public announcement of the Tylenol poisonings. Given that Johnson & Johnson's beta exceeds one, its stock price should have outperformed the market over this event window in the absence of the Tylenol poisonings—this fact accentuates the negative cumulative abnormal performance realized by Johnson & Johnson.

The sharply contrasting differences between the returns to Johnson & Johnson and the market-adjusted returns illustrate an important point that is relevant for securities fraud cases. Occasionally, announcements by corporations occur contemporaneous with large overall stock market movements. These market movements must be accounted for to isolate the stock price impact of the firm's announcement. It is then possible to assess the materiality of the information and the value of the information contained in the announcement for disgorgement purposes.

A hypothetical example using the Johnson & Johnson facts shows how it may be important to account for market movements in using financial

116. The z-statistics for the cumulative returns simply are computed as the square root of the sum of the variances associated with each of the daily returns over the event window. For example, to compute the z-statistic for the cumulative return of −4.88% over the first two days of the event window, the standard error of the forecast for each of the two days is squared to obtain the variance for each of these two days. The square root of the sum of the two variances is the standard error for a two-day cumulative return. The reason to convert to variances before summing is that mathematically, variances can be summed whereas standard deviations cannot. Note that the variances are cumulated based on logarithmic returns due to better specified distributional properties.

economics in securities fraud cases. Suppose an employee of Johnson & Johnson found out at his job on September 30 that there were poisonings. He then either sold stock or bought puts in Johnson & Johnson before the public received any news of the poisonings. In an insider trading case brought against this employee, financial economics could be used to show the information he had was material and to calculate disgorgement. As stated previously, the cumulative abnormal return of −22.39% is much more negative than the cumulative return of −8.94% over the period the news about the poisonings became public. Because the insider's information was about factors that affected Johnson & Johnson's stock price and not the overall market, the cumulative abnormal return is theoretically a better measure of the materiality of the information than the cumulative return. In this case the very large cumulative abnormal return of −22.39% significantly buttresses the claim of materiality.

For the same reason, cumulative abnormal returns are also theoretically a better measure than cumulative returns in calculating profits for disgorgement. Cumulative abnormal returns only measure the impact of firm-specific information, in this case the news about poisonings. In a real sense, the value of the information to the trader is best represented by how the information would have affected the stock price in the absence of any other factors—the cumulative abnormal return. Finally, note that this analysis is even more intuitively appealing if the employee in his trading hedged against overall market movements.

In addition, note the role of statistical tests in this example. The cumulative abnormal return of −22.39% has an associated z-statistic of −4.96. That z-statistic indicates that the cumulative abnormal return is highly significant—at the one percent level. Therefore, it is very unlikely that the negative cumulative abnormal return occurred by chance, which is strong evidence that the information about the Tylenol poisonings led to the negative cumulative abnormal return. The finding of statistical significance is thus strong evidence the information was material and it boosts the credibility of disgorgement estimates based on the cumulative abnormal returns.

USE OF FINANCIAL ECONOMICS IN SEC ENFORCEMENT CASES

Two roles for financial economics in securities fraud cases—determining materiality and calculating disgorgement—have been suggested. The event study methodology provides the basis for these two roles. The following five recent SEC cases provide evidence of staff economists participating in the determination of materiality and disgorgement.[117]

INSIDER TRADING BY AN EXECUTIVE RECRUITER

In September 1986, Artel Communications, a small fiber-optic telecommunications firm traded on NASDAQ, fired its chief executive officer and hired Ingoldsby Associates to recruit a replacement. Three months later Ingoldsby Associates recommended Robert Bowman for the position, and on February 4, 1987 Artel's board voted to offer the job to Bowman. On the morning of February 9, Artel informed Ingoldsby Associates that Bowman accepted. Later that day, Michael O. Ingoldsby, president of Ingoldsby Associates, purchased 23,500 shares of Artel stock for approximately $72,000 (average price of $3.06 per share). Artel announced the appointment the following morning; Reuters Ltd. and Dow Jones News Service reported the appointment at 11:17 a.m. and 4:13 p.m., respectively. In April 1989, the SEC charged Ingoldsby with insider trading based on information he misappropriated from Artel.

Table 2 displays Artel's stock market performance during the period surrounding Bowman's appointment.[118] Over the two-day period, February 10 (announcement date) and the prior day, Artel's stock price increased from $2.25 to $3.75. The abnormal return on the announcement day is 20.53% and is 45.38% on the prior day. The large abnormal return on February 9, the day prior to the announcement, is likely due to trading by Ingoldsby and leakage of the information. As noted *supra*, stock prices often move significantly prior to a material announcement as the information leaks out. For example, Ingoldsby's purchase of 23,500 shares on the 9th was very large relative to prior days. The average daily number of shares traded for Artel over the prior year was 13,948. Thus, the trades by Ingoldsby alone on February 9 exceeded the daily average by 69%. The total trading volume of 72,000 shares on February 9 was more than five times higher than the daily average. His own trades and the fact that he told his broker that an important announcement was about to take place

117. Only cases for which relevant information may be obtained from the SEC under the Freedom of Information Act are discussed. Cases that would require consideration of any nonpublic information are not discussed. For example, financial economic analyses at the SEC may suggest that potential suits not proceed. Such investigations are not mentioned here.

118. The facts for this case originate from SEC v. Ingoldsby, Litigation Release No. 12,461, [1990 Transfer Binder] Fed. Sec. L. Rep. (CCH) ¶ 95,351 (May 15, 1990) and Thomas Newkirk & Catherine Shea, *Civil Penalties and the Securities and Exchange Commission's Recent Jury Trial Experience Under the Insider Trading Sanctions Act*, in SECURITIES ENFORCEMENT INSTITUTE 289 (PLI Corp. Law & Practice Course Handbook Series No. 741, 1991).

119. Abnormal and cumulative abnormal returns are calculated in the same manner as in the Johnson & Johnson example. To maintain continuity in this Article, in all cases the value-weighted CRSP index of all NYSE, AMEX, and NASDAQ stocks are used as the market proxy. There are instances, however, in the actual cases at the SEC, depending on the facts of the case, that staff economists also tried different market indexes as well as industry indexes in the estimates. Likewise, in the financial economic analysis of these cases at the SEC, economists also tried several different estimation periods ranging from 100 to 300 days to calculate betas. The purpose was simply to test all alternatives so as to verify the robustness of the estimates. Here, however, for reasons of simplicity only the results based on the broad-based CRSP index and on estimation periods that cover the 253 days (one year) prior to the event are presented.

at Artel may have provided signals to other investors that firm-specific information was imminent.

The stock price remained relatively flat until February 18 when it rose to $4.50 (abnormal return is 20.25%). On this date, a federal holiday, a February 16 article published in *Fiber Optics News* became publicly available. It reported that Bowman would remain a director at Telco Systems where he previously was chairman.[120] *Fiber Optics News* indicated considerable potential for synergies between the two firms as they were direct competitors.[121] The only other large stock price movement in February occurred towards the end of the month when Artel's stock dropped roughly 15% on February 25, from $4.25 to $3.625. This decline occurred following a *Dow Jones Broadtape* story at 6:20 p.m. the prior day reporting fourth-quarter 1986 losses for Artel.

In order to prove insider trading, the SEC must establish that the investor possessed material, nonpublic information.[122] For this case, two factors warranted the use of financial economics in establishing materiality—the relative importance of a management appointment and the fact that Artel was a thinly-traded stock. First, would a reasonable investor consider a managerial appointment important? The majority of insider trading cases involve corporate control transactions where a large price movement generally occurs. This is not the case with managerial appointments, however, as empirical studies indicate a small, positive return at the announcement of top management appointments.[123] Poorly managed firms[124] or firms in financial distress[125] exhibit larger returns, but at most the average abnormal return is only about three percent. These studies, however, indicate substantial variation across the abnormal returns and thus the stock price movement associated with the Bowman announcement is not incompatible with the academic evidence.[126]

The second step in establishing materiality is the significance of the price movement. As indicated in the Artel example, the positive abnormal re-

120. *Bowman Lowered Chairman, CEO of Artel Communications*, FIBER OPTICS NEWS, Feb. 16, 1987, at 1.

121. *Id.*

122. *See generally* Dirks v. SEC, 463 U.S. 646 (1983); Chiarella v. United States, 445 U.S. 222 (1980).

123. *See* Eugene P. H. Furtado & Vijay Karan, *Causes, Consequences, and Shareholder Wealth Effects of Management Turnover: A Review of the Empirical Evidence*, 19 FIN. MGMT. 60 (1990).

124. *See* Michael S. Weisbach, *Outside Directors and CEO Turnover*, 20 J. FIN. ECON. 431 (1988).

125. *See* Karl-Adam Bonnier & Robert F. Bruner, *An Analysis of Stock Price Reaction to Management Change in Distressed Firms*, 11 J. ACCT. & ECON. 95 (1989).

126. According to the review article by Eugene P. H. Furtado and Vijay Karan, *see supra* note 123, the research has centered on NYSE and AMEX firms. It is likely the stock price reaction is larger for NASDAQ firms, especially small ones such as Artel, which had an equity value of only about $6 million prior to the announcement, because managerial capital arguably represents a greater proportion of total value in smaller firms.

turns are very large on the announcement day, February 10, and th[illegible] day, as well as February 18 in conjunction with the *Fiber Optics News* story. Even so, it is especially important to test for statistical significance because Artel is a thinly-traded stock. For example, during 1986 the daily average trading volume for Artel's stock was only 25% of the average daily trading volume for the average NASDAQ stock and only about 5% of the average daily trading volume for all publicly traded stocks. As noted *supra*, small stocks are considerably more volatile than large stocks—thus, the abnormal returns must be larger before a given abnormal return can be considered significantly different from zero. This general fact is true for Artel as well. For example, the standard deviation of Artel's stock returns over the prior one-year period is 5.57%. Thus, for a given day, Artel's stock return must be about 11% before significance can be asserted. In contrast, recall from the Tylenol example that the standard deviation of Johnson & Johnson's return was 1.84%. Here, for this large NYSE firm that exhibits less volatile price movements, significance on a given day can be asserted with a much smaller stock price movement.

In spite of the fact that Artel's stock price is very volatile, the abnormal returns on the announcement day, February 10, the prior day, and February 18 (associated with the *Fiber Optics News* article), the positive abnormal returns are highly statistically significant largely because of the magnitude of these abnormal returns.

Even though the abnormal returns are statistically significant around the information release dates, trading volume also is very high on these dates. It is possible that the high trading volume might have created temporary price pressure on Artel stock. The stock price, however, remains stable until the negative earnings announcement at the end of the month, buttressing the SEC's establishment of materiality. Furthermore, the cumulative abnormal return remains significant at the five percent level throughout the entire month.

This analysis suggests that Ingoldsby could have profited from the inside information, thus warranting disgorgement. Ingoldsby purchased 23,500 shares for $72,000 (average price of $3.06). On February 24, Ingoldsby sold 3000 shares at $4.125 and one day later he sold 1000 at $3.875. He then held on to the remaining 19,500 shares until the spring of 1989 when he sold at an average price of $2.00. Thus, Ingoldsby realized actual losses of about $17,000 on his investment based on inside information. As noted *supra*,[127] however, paper profits, not actual profits, theoretically provide a better benchmark with which to calculate disgorgement.

In calculating paper profits, the full information price is the first date when Artel's stock price fully reflected the information regarding the Bowman hiring. While most of the price reaction occurred at the announcement, Artel's price also increased significantly one week later subsequent

127. *See supra* text accompanying note 65.

to the *Fiber Optics News* story which noted that Bowman would rem... a director at Telco Systems, increasing the likelihood of potential business combinations between the two competitors. If Ingoldsby knew that Bowman would remain a director at Telco, then the full information price would reflect the February 18 price increase. The SEC argued that the full information price extend out to February 18 to reflect the price impact of the *Fiber Optics News* story.[128] In contrast, Ingoldsby claimed the court should follow the standard set by *Texas Gulf Sulphur* and base disgorgement on the closing price the day after the announcement.[129] Thus, he argued for a full information disgorgement price of $3.75, the closing price on February 11.[130]

The court accepted the SEC's argument and held that the full information price was $4.50, the closing price on February 18.[131] The court calculated disgorgement at $24,663, accounting for commission costs ($0.10 per share), bid ask spread ($0.25 per share), and other factors.[132] Thus, while Ingoldsby actually lost money on his transactions, he was required to disgorge the paper profits realized from his trading. In outlining its decision, the court stated:

> Artel was a relatively small company with limited media attention and exposure. Although a story regarding the new Artel president ran in the Wall Street Journal on February 11, 1987, I find that the news was not fully disseminated, absorbed and digested by the investing public until after the Bowman articles appeared in the fiber optics trade publications.[133]

In sum, this case illustrates the application of financial economics in an insider trading action. The event study technique is applied to show that information about a pending managerial appointment is material. Additionally, the event study analysis is used to calculate the value of inside information for disgorgement calculations.

128. The SEC and the court cited the *MacDonald* case as precedent for extending the event window a few days beyond the date of the original announcement. SEC v. Ingoldsby, Litigation Release No. 12,401, [1990 Transfer Binder] Fed. Sec. L. Rep. (CCH) ¶ 95,351, at 96,694-95 (May 15, 1990). Despite the apparent similarities between the two cases, however, the argument for a longer window is stronger in this case than it was in *MacDonald*. As previously discussed, there are two problems with the district court's reasoning in the *MacDonald* case. First, in *MacDonald* the follow-up *Wall Street Journal* story was unrelated to the information on which MacDonald traded. Second, the overall stock market increased a great deal during the long event window used in *MacDonald*. Both of these factors are different in the *Ingoldsby* case. In *Ingoldsby*, the subsequent *Fiber Optics News* story is directly related to Ingoldsby's inside information. Also, there were no market swings during the long window in *Ingoldsby* that could have caused the significant increase in Artel's stock price.

129. *Id.* at 96,694-95.

130. *Id.* at 96,695.

131. *Id.*

132. *Id.*

133. *Id.*

OFFICER OF ACQUIRER SELLS TARGET STOCK BUYS CALL OPTIONS IN ACQUIRER[134]

On March 9, 1987, Robert Slattery, divisional vice president of Reebok International, purchased Reebok call options and sold stock of Avia Group International. On the following day, Reebok announced an agreement to acquire Avia in a move to expand market share in the athletic shoe industry. In September 1988, the SEC charged Slattery with trading on the basis of inside information.

On February 11, 1987, one month prior to his alleged insider trading, Slattery purchased 1000 shares in Avia at $19 per share.[135] Coincidentally, twelve days later, at a Reebok executive meeting, Slattery learned of Reebok's interest in acquiring Avia at about $16 a share. For the next two weeks, Reebok and Avia officials engaged in merger negotiations, culminating in Reebok's announcement of the acquisition on March 10. During this period, Slattery participated in Reebok's investigation of Avia's facilities. On the day before the merger announcement, Slattery sold his 1000 shares of Avia stock at $26 a share. He also purchased twenty March call option contracts on Reebok stock with exercise price $40 at $75 per contract and twenty April call option contracts with exercise price $40 at $156 per contract.

Table 3 displays the stock and option price performance for Reebok and the stock price performance for Avia during the period surrounding the merger proposal.[136] On the merger announcement date, March 10, 1987, Reebok's stock price increased from $37.50 to $41.75. The stock market impact of the merger proposal occurred largely on the announcement day as Reebok's stock price did not move very much on any of the days surrounding the announcement. Because Slattery purchased Reebok calls, Table 3 also displays Reebok option prices for March 40 calls and for April 40 calls. In both cases, the price of the calls increased greatly on March 10: the March 40 calls increased from $0.8125 to $2.50 and the April 40 calls increased from $1.875 to $4.125.

The primary issue in this case concerned the establishment of materiality.[137] This issue is especially important here because Slattery's trading pattern before the announcement—sell shares in the target and buy calls in the acquirer—is unprofitable in a typical merger. Thus Slattery may argue that his trading behavior could not have been based on information regarding a subsequent merger announcement as it is well known that the stock price of the target almost always increases upon acquisition an-

134. The facts of the case originate from SEC v. Slattery, Litigation Release No. 11,856, 1988 SEC LEXIS 1758 (Sept. 2, 1988).

135. The SEC did not charge Slattery with buying the Avia stock based on inside information, only the subsequent sale of Avia shares was considered illegal. *Id.*

136. *See infra* Table 3.

137. *Slattery*, 1988 SEC LEXIS 1758.

nouncement. Furthermore, some financial economists document that the average stock price reaction to acquiring firms for acquisition announcements during the 1980s was negative.[138]

While the average announcement-period return may have been negative for some samples and close to zero for most studies, large price increases for the acquiring firm are not that uncommon. In a study of 401 acquisitions during 1982-86 (Average Abnormal Return = −0.08%, z-statistic = −0.45), however, Mark L. Mitchell and Kenneth Lehn found that in 51 of the acquisitions, the stock price of the acquiring firm increased more than five percent during a three-day window surrounding the announcement.[139] Furthermore, researchers recently documented positive stock price reactions to acquirers when the merging firms operate in the same line of business.[140]

Moreover, as displayed in Table 3, the Reebok abnormal return of 9.90% on March 10, the announcement day, is statistically significant at the one percent level (z-statistic is 2.80). For the ten trading days surrounding the announcement, none of the abnormal returns are statistically different from zero, indicating that there was little leakage prior to the merger announcement and that the initial price reaction on March 10 captured the full impact of the announcement (notice that the cumulative abnormal remains fairly steady after March 10). The combination of the large stock price and option price movement for Reebok on the day of the merger announcement and the prior empirical evidence suggests Slattery possessed material, non-public information.

Further evidence that Slattery had material information comes from the fact that he sold Avia stock the day before the announcement, and Avia's stock price fell from $25 to $17.25 on the announcement day. This stock price decline contrasts sharply with the large, positive price reaction that almost always occurs with target firms, and illustrates the facts of this merger are unique. Insiders and venture capitalists owned most of the stock in Avia. While Avia never went public, roughly 800,000 converted debentures (about eight percent of the common stock) from a 1981 financing traded in the "pink sheet" over-the-counter market. Prior to the Reebok merger offer, it was known publicly that Avia was in the process of planning a public offering at $11 to $14 a share. As Table 3 indicates, investors in the small pink sheet market for Avia stock anticipated that the price after the public offering would rise well above the $11 to $14 range. Consequently, when Reebok announced the merger pact wi[...]a at a price of $16.50, the share price of Avia fell sharply from $25 to $17.25. Therefore, Slattery's trades that on the surface appear surprising were actually predictably profitable. He bought his 1000 shares of Avia a month earlier at $19 a share. By the day of his trades (March 9), Slattery knew that Reebok's merger was likely to go forward. Consequently, he had material information given that Avia's stock price was trading at about $25 rather than $16.35. The 31% decline in Avia's price in the pink sheet market suggested a material price change even for a stock with thin trading.

Disgorgement calculation is simple in this case because Slattery's security transactions clustered around the announcement date. For the Reebok call options, the SEC computed the difference between the purchase price on March 9 and the sale price on March 10, adjusting for commission costs.[141] For the sale of the Avia stock on March 9, the SEC computed disgorgement as the difference between the price of $26 at which he sold the 1000 shares on March 9 and the closing price of $16.50 on March 10,[142] the merger announcement date, applying the arguments of the efficient markets hypothesis that stock price rapidly adjusts to the release of new information.[143] Neither admitting or denying the allegations, Slattery agreed to settle with the SEC by disgorging profits of $11,129 and paying a penalty of the same amount.[144]

DELINQUENT SCHEDULE 13D FILING[145]

On December 18, 1987, Francis Spillman, president of Pizza Inn, bought 50,000 shares of a chain of chicken restaurants called Winners Corporation, increasing his stake from 4.31% to 5.56%. Because Spillman crossed the five percent threshold with this purchase, SEC rules required him to file a Schedule 13D within ten calendar days, reporting his ownership stake and intention for Winners.[146] Spillman, however, did not file a Schedule 13D until January 6, eight days later than required. During the period between the required filing date and the actual date of filing (December 29 through January 5), Spillman bought an additional 45,000 shares increasing his stake to 6.9%. When Spillman filed the Schedule 13D on January 6 reporting the 6.9% stake, he also revealed a tender offer consideration at $4.25 per share for the remainder of the stock. Winners

138. *See* Jarrell & Poulsen, *supra* note 95; Michael Bradley et al., *Synergistic Gains from Corporate Acquisitions and Their Division Between the Stockholders of Target and Acquiring Firms*, 21 J. Fin. Econ. 3 (1988).

139. Mark L. Mitchell & Kenneth Lehn, *Do Bad Bidders Become Good Targets?*, 98 J. Pol. Econ. 372 (1990).

140. *See* Neil W. Sicherman & Richard H. Pettway, *Acquisition of Divested Assets and Shareholders' Wealth*, 42 J. Finance 1261 (1987); Randall Morck et al., *Do Managerial Objectives Drive Bad Acquisitions?*, 45 J. Finance 31 (1990).

141. *Slattery*, 1988 SEC LEXIS 1758.

142. *Id.* The March 10 closing price of $16.50 used in disgorgement differs from the price given in Table 3, as the latter price is the daily average of the bid and ask prices.

143. *Id.*

144. *Id.*

145. The facts of the case originate from SEC v. Spillman, Litigation Release No. 12,321, 1989 SEC LEXIS 2384 (Dec. 13, 1989).

146. 17 C.F.R. §§ 240.13d-1(a), -2(a) (1993). During the ten days following December 18, Spillman purchased an additional 19,900 shares.

05/07/97 WED 13:35 FAX 914 448 4041 NERA

rejected the potential offer, and three months later Spillman be[illegible] reducing his stake; by October Spillman had sold all of his Winners' stock.

In December 1989, the SEC charged Spillman with violating section 13(d) of the Exchange Act.[147] Specifically, the SEC argued that during the period from December 29, 1987 to January 5, 1988, Spillman purchased Winners' stock at prices that did not reflect the information that should have been reported in the Schedule 13D.[148] Academic research in 1985 supports this argument;[149] these studies document significant, positive price reactions to announcements of Schedule 13D filings. The SEC sought disgorgement of the savings Spillman realized in purchasing the 45,000 shares from December 29 to January 5.[150]

As noted *supra*, the SEC first sought disgorgement for Schedule 13D violations in *First City* where the court required disgorgement of the actual profits.[151] The court used actual profits, which it recognized were only a reasonable approximation of the "ill-gotten gains," because they were easy to calculate—the difference between the price the defendants received when they sold their stock back to the corporation and the price they paid for the stock.[152] In *First City* the defendants sold their stock shortly after the 13D filing so that the paper profits were similar to the actual profits. In this case, however, actual profits might not be a reasonable approximation of the paper profits from the late filing because Spillman waited three months before beginning to sell some of his shares.

Table 4 displays the stock price performance for Winners for December 11, 1987 through January 22, 1988.[153] Table 4 also reports the ratio of daily volume to the mean volume over the prior year in Winners' stock and the ratio of the volume accounted for by Spillman to the mean volume over the prior year. Table 4 shows Winners' stock price rose during the period when Spillman was purchasing large numbers of Winners' shares, before filing the required Schedule 13D. Specifically, from December 11 through January 5 the cumulative Abnormal Return for Winners' stock was roughly 70% a period during which Spillman accounted for 45.5% of the trading volume. For example on December 16, when Spillman purchased 107,500 shares (accounting for all but 3000 shares traded that day), Winners' price increased from $1.375 to $1.50, and on December 18, when Spillman purchased 50,000 shares (accounting for 42% of shares traded), Winners' price increased from $1.50 to $2.25. Besides accounting for a substantial amount of the trading volume on these days, the volume of Spillman's trades often exceeded historical volume. For example, on December 16, Spillman's volume was 12.2 times greater than the [illegible] average daily volume over the prior year.

An argument that Spillman should not be required to disgorge any profits from the late Schedule 13D filing rests on the observation he simply could have purchased the 45,000 shares during the ten-day period after crossing the five percent threshold but before the required filing date (that is, by December 28). The stock price evidence, however, suggests Spillman could not have purchased the 45,000 shares in this period without increasing the market price. Therefore, it is likely that, to the extent that the late Schedule 13D filing enabled Spillman to spread his purchases over a longer period, he was able to buy shares more cheaply; otherwise he would have purchased them during the authorized time period.

The disgorgement issue focuses on the determination of the price that Spillman would have had to pay for the 45,000 shares purchased from December 29 through January 5 had he filed on December 28, as required, rather than January 6. On January 6 when Spillman announced his Schedule 13D filing, Winners' stock price increased from $2.50 to $3.00 (abnormal return = 19.98%, z-statistic = 3.72). Thus, one could argue that if Spillman filed on December 28, Winners' stock price would have closed at $3.00 rather than $1.875 (actual closing price on December 28th and 29th).[154] Accordingly, Spillman should disgorge the difference between the price he paid for the 45,000 shares and $3.00.

Winners' stock price performance after the Schedule 13D filing suggests, however, that $3.00 may be too high a price to use for disgorgement. While the price increased from $2.50 to $3.00 on January 6, the date of the 13D filing announcement, it began to fall two days later. The decline in the stock price suggests the $3.00 price partly reflected the market overestimating the probability of a successful tender offer. Furthermore, the data in Table 4 indicate that the market reacted to Spillman's trades during the period around the filing. Spillman often accounted for a large proportion of the total volume and his large purchases likely led to price pressure, as evidenced by the fact that the price increased on those days in which he made relatively large purchases. In addition, in almost all cases Spillman made his purchases at the high price of the day, likely due to his large share amounts.

Consequently, the SEC based the price that Spillman should have paid for the 45,000 shares on the estimated price at which he could have sold these shares following the Schedule 13D filing. As argued *supra*, it is unlikely that Spillman could have sold the shares for $3.00 because Winners'

147. 15 U.S.C. § 78m(d) (1988).
148. *Spillman*, 1989 SEC LEXIS 2384.
149. *See supra* note 73.
150. *Spillman*, 1989 SEC LEXIS 2384.
151. *See supra* text accompanying notes 74-82.
152. SEC v. *First City Fin. Corp.*, 890 F.2d 1215, 1231 (D.C. Cir. 1989).
153. *See infra* Table 4.

154. It could be argued that had Spillman filed on December 28, Winners' stock price would not have risen fully to $3.00, because the $3.00 closing price on January 6 reflected the purchases of the 45,000 shares during the period December 29 to January 5. Holderness and Sheehan, however, find little evidence of a relation between the size of the purchase by an investor filing a Schedule 13D and the stock price reaction. *See* Holderness & Sheehan, *supra* note 73, at 565.

stock was thinly traded and Spillman's purchases often accounted for a large amount of the trading volume. Thus, the SEC used the average price ($2.675) over the two-week period following the Schedule 13D filing as a basis for disgorgement calculation, under the assumption that he could have sold his shares over this longer period without having a large market impact. Spillman agreed to a permanent injunction against further violations and paid disgorgement of roughly $24,000, without admitting or denying the allegations.[155]

CHAIRMAN LEAKS PRIVATE INFORMATION TO ANALYSTS[156]

On May 15, 1987, Ultrasystems Corporation announced lower earnings than expected for the first quarter of 1987. The day before, Phillip J. Stevens, founder and chairman of Ultrasystems, called several analysts who followed Ultrasystems and informed them of the bad news. The analysts in turn advised their clients who then sold the stock that day and the following morning prior to the announcement at 3:14 p.m. In March 1991, the SEC charged Stevens with violation of insider trading by providing the negative information to select analysts in advance of the press release.[157]

On May 15, the day of the press release, the price of Ultrasystems' stock dropped about eight percent (negative abnormal return of roughly seven percent), a decline that was statistically significant. In the typical insider trading case, the establishment of materiality relies partly on the stock price reaction at the announcement of the information. This case is unique because Ultrasystems' stock price did not move very much subsequent to the 3:14 p.m. announcement on May 15, thus putting into question the materiality of the information. Instead almost all of the statistically significant abnormal price decline on May 15 occurred by 10:15 a.m. The price fall during the first few minutes of trading on May 15, however, occurred just after large sell orders from the analysts' clients, thus indicating materiality—in this case, the stock market just responded to the negative information hours prior to its official actual release rather than afterwards.[158] Neither admitting nor denying the insider trading allegations, Stevens settled with the SEC by disgorging more than [illegible],000 based on the losses the analysts' clients avoided by selling the stock prior to the announcement.[159]

CORPORATE RAIDER SELLS STOCK IN TARGET FIRM IMMEDIATELY FOLLOWING TAKEOVER BID[160]

On February 29, 1988, Mesa Limited Partnership, of which T. Boone Pickens Jr. is the general partner, publicly announced a 3.8% stake in Homestake Mining and offered to acquire the remaining shares at $20 a share. Upon this announcement, Homestake's stock price jumped from $14 to $18. That same day, Mesa began selling its stock in Homestake as well as some call options. Mesa continued to sell shares in Homestake for the next several days without issuing a press release informing the public of its sale transactions. In September 1990, the SEC charged Mesa with negligence without fraudulent intent.[161]

The SEC claimed Mesa's February 29 press release was misleading because it did not reveal Mesa's intentions to sell shares in Homestake, enabling Mesa to sell Homestake stock at inflated prices. The primary issue was whether Mesa's initial reporting of the ownership stake can be considered material, aside from the offer to acquire the remaining shares of Homestake. If the 3.8% ownership disclosure is material, then the decision to sell the stake is also likely a material event and hence should be disclosed promptly.[162]

As stated earlier, the announcement of a Schedule 13D filing generally results in a significant, positive stock price change. Hence, the disclosure of ownership stakes is typically material. Furthermore, an examination of Mesa's prior announcements of ownership stakes in various corporations indicates a large, positive stock price reaction. This suggests that investors considered the announcement of the 3.8% stake in Homestake to be material. Thus, the decision not to disclose promptly the sale of the stake can be considered material as well. Mesa settled with the SEC without

155. SEC v. Spillman, Litigation Release No. 12,321, 1989 SEC LEXIS 2384 (Dec. 13, 1989).

156. The facts of the case originate from SEC v. Stevens, Litigation Release No. 12,813, 1991 SEC LEXIS 451 (Mar. 19, 1991).

157. *Id.* This case is the first in which the SEC charged that a corporate insider violated insider trading laws by providing material information to analysts. While the analysts did not pay Stevens for the inside information, the SEC argued that Stevens benefitted by enhancing his reputation among analysts. *Id.* Stevens' reputation recently was tarnished as a result of issuing positive forecasts only to be followed by unexpected bad earnings announcements, such that some analysts actually ceased covering Ultrasystems.

158. See Meulbroek, *supra* note 95, for an empirical analysis of insider trading cases. She shows that stock prices often move prior to material announcements as a result of insider trading. *Id.* at 1675.

159. *Stevens*, 1991 SEC LEXIS 451.

160. The facts of the case originate from SEC v. Mesa Ltd. Partnership and T. Boone Pickens, Litigation Release No. 12,637, [1990 Transfer Binder] Fed. Sec. L. Rep. (CCH) ¶ 95,492 (Sept. 27, 1990).

161. *Id.* at 95,572.

162. An argument could be made that Mesa sold the stake to hedge its investment in Homestake by covering potentially large losses in the event of unsuccessful merger. There are a few isolated cases involving this strategy. For example, in 1989 when Alfred Checchi acquired NWA, he sold more than half of a 4.9% stake in NWA at a time when it still was not certain that the acquisition would go forward. The explanation was his intention to use the proceeds of the sale to pay the merger proposal expenses. *See Checchi Cut NWA Stake to 1.9%, Filing Indicates*, WALL ST. J., June 26, 1989, at C9.

admitting or denying the allegation by disgorging $2.3 million [illegible]ofits from sales of Homestake stock.[163]

SUMMARY

Modern financial economics is becoming increasingly influential in securities fraud law. The efficient markets hypothesis has provided a framework for the analysis of certain questions and a basis for generating empirical evidence on the value of information in individual cases. Clearly, there are certain areas of securities law where the efficient markets hypothesis continues to have an impact. Of particular importance is an empirical technique derived from the efficient markets hypothesis—the event study. Event studies are useful to establish, among other things, materiality and calculate damages in securities fraud litigation. Event study analysis already was applied in five SEC enforcement actions.

There are many areas in securities fraud litigation where empirical techniques from financial economics may be useful. Indeed, event study techniques potentially are much more valuable than described in this Article. Event study analysis is useful at all stages of litigation to both defendants and plaintiffs. The analysis is applicable, not just in SEC insider trading cases, but in all types of securities fraud actions, including private suits. Furthermore, by providing objective, relatively precise measures of the importance of information and of illegal profits or damages, the importance of financial economics in securities fraud litigation will continue to increase.

163. *Mesa Ltd. Partnership*, [1990 Transfer Binder] Fed. Sec. L. Rep. (CCH) at 95,573.

TABLE 1

Stock Price Performance for Johnson & Johnson Following the 1982 Tylenol Poisonings

Panel A: Actual Returns Performance

				Cumulative	
Date	Stock Price	Return	Z-statistic	Return	Z-statistic
Sept. 29	46.125				
Sept. 30	43.125	−6.51	−3.55	−6.51	−3.55
Oct. 1	43.875	1.74	0.95	−4.88	−1.88
Oct. 4	41.250	−5.98	−3.29	−10.57	−3.33
Oct. 5	39.000	−5.46	−2.97	−15.45	−4.21
Oct. 6	41.750	7.05	3.84	−9.49	−2.31
Oct. 7	40.375	−3.29	−1.80	−12.47	−2.77
Oct. 8	42.625	5.57	3.04	−7.59	−1.56
Oct. 11	43.500	2.05	1.12	−5.69	−1.10
Oct. 12	41.500	−4.60	−2.51	−10.01	−1.82
Oct. 13	42.000	1.21	0.66	−8.94	−1.54

Panel B: Net-of-Market Returns Performance

Date	Stock Price	Net-of-Market Return	Z-statistic	Cumulative Net-of-Market Return	Z-statistic
Sept. 29	46.125				
Sept. 30	43.125	−5.62	−3.95	−5.62	−3.95
Oct. 1	43.875	0.54	0.38	−5.11	−2.54
Oct. 4	41.250	−5.74	−4.03	−10.56	−4.28
Oct. 5	39.000	−5.88	−4.13	−15.82	−5.50
Oct. 6	41.750	3.96	2.78	−12.48	−3.92
Oct. 7	40.375	−5.45	−3.83	−17.25	−4.95
Oct. 8	42.625	3.77	2.65	−14.13	−3.75
Oct. 11	43.500	−0.36	−0.25	−14.43	−3.58
Oct. 12	41.500	−4.61	−3.24	−18.38	−4.30
Oct. 13	42.000	−0.65	−0.45	−18.91	−4.20

TABLE 1 (continued)
Stock Price Performance for Johnson & Johnson Following the 1982 Tylenol Poisonings

Panel C: Abnormal Returns Performance

Date	Stock Price	Abnormal Return	Z-statistic	Cumulative Abnormal Return	Z-statistic
Sept. 29	46.125				
Sept. 30	43.125	-5.46	-3.85	-5.46	-3.85
Oct. 1	43.875	0.10	0.07	-5.37	-2.67
Oct. 4	41.250	-5.76	-4.07	-10.83	-4.40
Oct. 5	39.000	-6.10	-4.31	-16.27	-5.73
Oct. 6	41.750	2.98	2.06	-13.78	-4.32
Oct. 7	40.375	-6.17	-4.31	-19.10	-5.47
Oct. 8	42.625	3.16	2.21	-16.54	-4.38
Oct. 11	43.500	-1.15	-0.80	-17.50	-4.33
Oct. 12	41.500	-4.72	-3.33	-21.39	-5.00
Oct. 13	42.000	-1.28	-0.89	-22.39	-4.96

Note: Returns are expressed in percents. Stock price data is from Center for Research in Security Prices (CRSP) at the University of Chicago. Market model estimation period is September 30, 1981 through September 29, 1982. Market proxy is CRSP value-weighted index of NYSE, AMEX, and NASDAQ stocks. Beta estimate for Johnson & Johnson is 1.29.

TABLE 2
Stock Price Performance for Artel Communications Surrounding the Announcement of Robert Bowman as Chief Executive Office on February 10, 1987

Date	Artel Price	Artel Volume	Abnormal Return	Z-statistic	Cumulative Abnormal Return	Z-statistic
Feb. 4	$2.250	10,100	-6.22	-1.12	-6.22	-1.12
Feb. 5	2.250	4,400	-0.41	-0.07	-6.61	-0.84
Feb. 6	2.250	1,600	0.56	0.10	-6.08	-0.63
Feb. 9	3.250	72,000	45.38	8.20	36.54	3.30
Feb. 10	3.875	68,100	20.53	3.70	64.56	5.22
Feb. 11	3.750	65,200	-3.73	-0.67	58.43	4.31
Feb. 12	3.625	16,300	-2.50	-0.45	54.47	3.72
Feb. 13	3.750	6,800	2.47	0.44	58.28	3.72
Feb. 17	3.750	25,600	-1.39	-0.25	56.09	3.38
Feb. 18	4.500	57,000	20.25	3.67	87.70	5.01
Feb. 19	4.500	23,500	0.17	0.03	88.02	4.79
Feb. 20	4.625	23,600	3.09	0.56	93.83	4.89
Feb. 23	4.250	7,300	-6.92	-1.25	80.42	4.03
Feb. 24	4.250	7,900	0.17	0.03	80.72	3.90
Feb. 25	3.625	24,700	-14.74	-2.67	54.08	2.52
Feb. 26	3.625	6,200	0.61	0.11	55.02	2.49
Feb. 27	3.500	6,200	-3.50	-0.63	49.59	2.17

Notes: Returns are expressed in percents. Stock price data is from Center for Research in Security Prices (CRSP) at the University of Chicago. Market model estimation period is February 4, 1986 through February 3, 1987. Market proxy is CRSP value-weighted index of NYSE, AMEX, and NASDAQ stocks. Beta estimate for Artel Communications is 0.96.

TABLE 3

Security Price Performance for Reebok and Avia International Surrounding Reebok's Acquisition Announcement of Avia on March 10, 1987

Date	Reebok Stock Price	Reebok Abnormal Return	Z-stat	Reebok Cumulative Abnormal Return	Reebok March 40 Option Price	Reebok April 40 Option Price	Avia Stock Price	Avia Return	Avia Cumulative Return
Mar. 2	36.250				0.5625	1.2500	23.000	0.00	0.00
Mar. 3	36.250	-0.53	-0.15	-0.53	0.5000	1.4375	23.000	6.52	6.52
Mar. 4	35.875	-3.14	-0.89	-3.65	0.3750	1.1875	24.500	16.33	23.91
Mar. 5	36.500	0.55	0.16	-3.12	0.4375	1.3125	28.500	-10.53	10.87
Mar. 6	36.875	0.60	0.17	-2.54	0.4375	1.4375	25.500	-1.96	8.70
Mar. 9	37.500	2.09	0.59	0.50	0.8125	1.8750	25.000	-31.00	-25.00
Mar. 10	41.750	9.90	2.80	9.34	2.5000	4.1250	17.250	-0.73	-25.54
Mar. 11	42.500	1.51	0.43	11.00	2.6250	4.3750	17.125	0.73	-25.00
Mar. 12	42.500	-0.81	-0.23	10.10	1.8750	4.2500	17.250	0.00	-25.00
Mar. 13	43.000	1.21	0.34	11.44	3.1250	4.6250	17.250	0.00	-25.00
Mar. 16	42.250	-1.40	-0.40	9.88	2.4375	3.8750	17.250	0.00	-25.00
Mar. 17	42.875	-0.51	-0.15	9.51	2.9375	4.3750	17.250		

Notes: returns are expressed in percents. Reebok stock price data is from Center for Research in Security Prices (CRSP) at the University of Chicago. Market model estimation period is March 3, 1986 through March 2, 1987. Market proxy is CRSP value-weighted index of NYSE, AMEX and NASDAQ stocks. Beta estimate for Reebok is 1.22. Reebok call option closing prices come from the *Wall Street Journal*. Avia stock price is the midpoint of the bid/ask spread. The Avia stock price data come from the *Portland Observer*.

TABLE 4

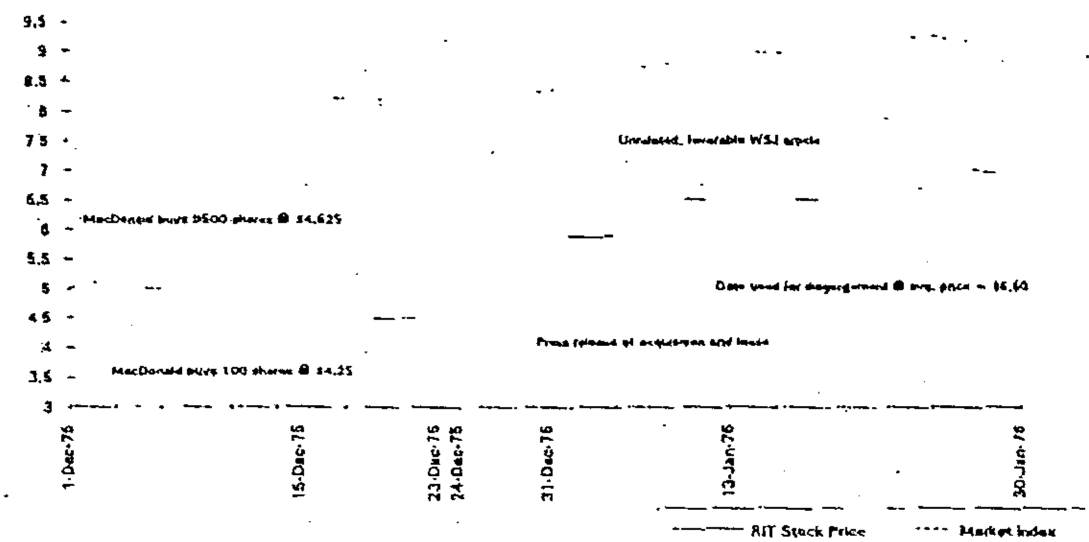
Stock price performance for Winners Corporation Surrounding Spillman's Delinquent Schedule 13D Filing on January 6, 1988 (required filing on December 28, 1987)

Date	Winners Price	Abnormal Return	Z-statistic	Cumulative Abnormal Return	Z-statistic	Volume/Mean Volume	Spillman Volume/Mean Volume
Dec. 11	1.500	8.71	1.62	8.71	1.62	0.25	
Dec. 14	1.375	-10.92	-1.99	-3.16	-0.41	5.46	1.14
Dec. 15	1.375	-0.06	-0.01	-3.22	-0.34	1.02	0.57
Dec. 16	1.500	7.32	1.35	3.87	0.36	12.54	12.20
Dec. 17	1.500	1.88	0.35	5.82	0.48	1.12	0.57
Dec. 18	2.250	47.96	8.80	56.57	4.26	13.53	5.67
Dec. 21	2.000	-11.22	-2.09	39.01	2.72	4.27	1.14
Dec. 22	2.000	0.21	0.04	39.30	2.57	5.46	0.11
Dec. 23	1.875	-7.29	-1.35	29.15	1.80	2.68	0.23
Dec. 24	2.000	7.15	1.33	38.39	2.25	0.42	0.22
Dec. 28	1.875	-3.58	-0.66	33.43	1.86	1.31	0.57
Dec. 29	1.875	0.65	0.12	34.31	1.83	6.01	2.22
Dec. 30	2.250	19.00	3.52	59.82	3.07	3.42	0.68
Dec. 31	2.250	0.44	0.08	60.53	2.99	0.90	0.90
Jan. 4	2.375	2.16	0.39	63.99	3.05	1.15	0.79
Jan. 5	2.500	4.26	0.79	70.97	3.28	1.12	0.51
Jan. 6	3.000	19.98	3.72	105.14	4.71	4.66	
Jan. 7	3.000	-0.53	-0.10	104.06	4.53	3.95	1.25
Jan. 8	2.875	2.23	0.38	108.61	4.58	0.78	0.34
Jan. 11	2.875	-0.99	-0.18	106.56	4.38	0.70	0.57
Jan. 12	2.750	-3.33	-0.62	99.67	4.00	5.23	3.97
Jan. 13	2.500	-9.05	-1.68	81.60	3.20	1.21	0.57
Jan. 14	2.625	5.20	0.97	91.05	3.50	1.98	0.57
Jan. 15	2.625	-2.23	-0.41	86.78	3.26	0.84	
Jan. 18	2.500	-4.58	-0.85	78.24	2.88	0.06	
Jan. 19	2.500	1.01	0.19	80.04	2.89	0.77	
Jan. 20	2.500	2.73	0.50	84.95	3.01	0.01	
Jan. 21	2.625	5.06	0.94	94.30	3.28	6.13	4.62
Jan. 22	2.750	3.72	0.69	101.53	3.48	0.11	

Notes: Returns are expressed in percents. Stock price and volume data is from Center for Research in Security Prices (CRSP) at the University of Chicago. Market model estimation period is December 11, 1986 to December 10, 1987. Market proxy is CRSP value-weighted index of NYSE, AMEX, and NASDAQ stocks. Beta estimate for Winners is 1.03.

FIGURE 1

Stock Price Performance for Realty Income Trust Associated with Insider Trading Prior to an Aquisition and Lease Announcement on December 24, 1975



590. The Business Lawyer; Vol. 49, February 1994

EXHIBIT
9

EXHIBIT
9

From: Terpsma, Allyson [mailto:ATerpsma@cornerstone.com]
Sent: Thursday, August 03, 2006 4:30 PM
To: Christopher James
Cc: Reed, Michelle; Rozen, Amir
Subject: FW: Golf Datatech Reports

Chris,
Per your request.
Thanks,
Allyson

From: Suzie Phillips [mailto:sphillips@golfdatatech.com]
Sent: Wednesday, August 02, 2006 12:34 PM
To: Goodman, Andrea
Subject: Golf Datatech Reports

Andrea,

The normal turn around time for *Golf Datatech Monthly Retail Market Share Reports* is between 25 to 33 days after the last day of the month we are reporting.

Suzie Phillips
VP/General Manager
Golf Datatech, L.L.C.

Δ π EXHIBIT 338
Deponent C. James
Date 8/1/06 Rptr. ph
WWW.DEPOBOOK.COM

EXHIBIT 10

EXHIBIT 10

IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF DELAWARE

\- -

IN RE: ADAMS GOLF, CA. NO.

INCORPORATED 99-371-KAJ

SECURITIES LITIGATION

\- -

Wednesday, August 9, 2006

Oral deposition of GARY L. FRAZIER, was taken pursuant to Notice, at the offices of SIMPSON THACHER & BARTLETT LLP, 425 Lexington Avenue, New York, NY 10017-3954 on the above date before DEBRA G. JOHNSON-SPALLONE, CSR, RPR, Notary Public, and a Federally Approved Reporter of the United States District Court commencing at or about 10:40 a.m.

RSA/VERITEXT COURT REPORTING COMPANY

1845 Walnut Street, 15th Floor

Philadelphia, PA 19103

(215) 241-1000 (888) 777-6690

Page 254

before they sent memos out 02:43:38PM
to channel members from 02:43:40PM
Beebe or from Gonsalves or 02:43:42PM
others talking about, or 02:43:47PM
reclarifying, their position 02:43:49PM
on gray marketing. 02:43:50PM
I summarize later some 02:43:53PM
of the steps -- this is on 02:43:56PM
page 14 -- where I felt this 02:43:57PM
-- in paragraph 44, that I 02:44:04PM
feel these steps taken were 02:44:06PM
reasonable and effective. 02:44:07PM
So, I don't -- based 02:44:09PM
on the record, they may -- 02:44:11PM
they obviously perceived it, 02:44:13PM
but I don't believe, as a 02:44:14PM
marketing expert, that they 02:44:16PM
were slow to react. 02:44:19PM
--- 02:44:19PM
BY MR. COLLINS: 02:44:19PM
Q. Okay. 02:44:20PM
One more document, 02:44:20PM
Exhibit-299, which is a memo to Scott 02:44:22PM
Levins, Eddie Tate. 02:44:26PM

Page 255

A. Thank you. 02:44:29PM
Q. And the memo goes on awhile, 02:44:33PM
but I am directing your attention to a 02:44:34PM
particular paragraph on the second page. 02:44:36PM
A. Okay. 02:44:38PM
Q. Paragraph at the bottom. 02:44:41PM
Middle bottom; as the Costco issue 02:44:43PM
worsened, retailers complained that Adams 02:44:45PM
was both evasive and slow with their 02:44:47PM
response. Retailers will point out how 02:44:49PM
other manufacturers who were quick to 02:44:53PM
address, fix and remedy the problems, 02:44:56PM
while we appeared to be myered in a myriad 02:44:58PM
of other conflicts. With this delay 02:45:02PM
came less in support from many of our 02:45:03PM
retailers, especially once word of 02:45:05PM
Costco's inventories growth spread. 02:45:08PM
That statement by Eddie 02:45:11PM
Tate, who was Florida regional account 02:45:14PM
coordinator, as indicated here, that also 02:45:16PM
has no impact on your -- on your opinion 02:45:18PM
here? 02:45:22PM
MR. GLUCKOW: Objection. 02:45:23PM
Vague and ambiguous. 02:45:23PM

Page 256

You can answer. 02:45:25PM
THE WITNESS: I read 02:45:25PM
it. Everything I read I 02:45:26PM
considered. 02:45:28PM
Ochoa had mentioned 02:45:32PM
in her deposition, and I 02:45:34PM
agree, that gray marketing 02:45:35PM
effects different 02:45:39PM
manufacturers differently 02:45:39PM
in the same industry. 02:45:41PM
In my opinion, as a 02:45:43PM
marketing expert, the steps 02:45:46PM
taken by Adams to deal with 02:45:47PM
gray market sales were 02:45:50PM
effective, and that they 02:45:52PM
needed to focus elsewhere on 02:45:56PM
marketing challenges much 02:45:58PM
more important to the firm 02:46:01PM
in ensuring that it's going 02:46:03PM
to be successful in this 02:46:04PM
industry. 02:46:06PM
--- 02:46:06PM
BY MR. COLLINS: 02:46:06PM
Q. All right. 02:46:06PM

Page 257

I don't want to be 02:46:07PM
argumentative, and I am not challenging in 02:46:08PM
this deposition, sir. 02:46:12PM
Your life background in 02:46:13PM
marketing -- 02:46:17PM
A. I am used to dealing with my 02:46:17PM
wife, so, go ahead. 02:46:18PM
Q. -- but you have said earlier 02:46:20PM
today, Professor, that, unlike some pointy 02:46:22PM
headed intellectual in the classroom, whom 02:46:28PM
might not deal with real world situations, 02:46:30PM
you are somebody who rolls up your sleeves 02:46:35PM
and you dealt with corporate management 02:46:37PM
and you have tried to see the way 02:46:40PM
marketing theory works in the real world. 02:46:45PM
A. Right. 02:46:47PM
Q. Is that fair? 02:46:47PM
A. Right. 02:46:49PM
Q. I am struck by how 02:46:52PM
cavalierly, with all due respect, you are 02:46:57PM
introduced to a flood of statements by 02:46:59PM
Costco management -- now, that would be 02:47:05PM
shocking. 02:47:07PM
I am struck by how you seem 02:47:07PM

Page 278

trenches in October '98 or 03:11:21PM
March '99, you don't have 03:11:24PM
all of the data. You don't 03:11:25PM
have time to really reflect 03:11:26PM
on things. You don't -- you 03:11:28PM
don't have two weeks to sit 03:11:31PM
down and only read documents 03:11:32PM
related to this one minor 03:11:33PM
issue when you have got so 03:11:34PM
many other issues bombarding 03:11:36PM
you in the marketing like 03:11:37PM
product, price, place, 03:11:38PM
promotion. It is not easy 03:11:40PM
to make the calls that they 03:11:41PM
did. 03:11:43PM
I am not -- but the key 03:11:43PM
here for me is; I have the 03:11:46PM
luxury of having a lot of 03:11:50PM
information. I have the 03:11:51PM
background. I have the 03:11:52PM
experience. I have 03:11:53PM
expertise. I have facts 03:11:53PM
in this case to render my 03:11:55PM
opinions, and that is what 03:11:57PM

Page 279

I've have done. 03:11:58PM
- - - 03:11:58PM
BY MR. COLLINS: 03:11:58PM
Q. Okay. 03:11:58PM
Now, are you familiar with 03:12:10PM
the fact that in 1997, 10K -- 03:12:12PM
A. Of Callaway? 03:12:18PM
Q. Callaway. 03:12:19PM
MR. GLUCKOW: Stop 03:12:20PM
reading his mind. Let him 03:12:21PM
get his question out. 03:12:23PM
THE WITNESS: Sorry. 03:12:24PM
- - - 03:12:24PM
BY MR. COLLINS: 03:12:24PM
Q. Callaway addressed gray 03:12:26PM
marketing as a risk factor of Callaway. 03:12:28PM
Are you generally familiar 03:12:36PM
with that? 03:12:37PM
A. I know -- I know they raised 03:12:37PM
it as a negative. 03:12:38PM
Q. Okay. 03:12:39PM
At that time, how extensive 03:12:42PM
was gray marketing at Callaway, if you 03:12:44PM
know? 03:12:46PM

Page 280

MR. GLUCKOW: Objection. 03:12:46PM
Overbroad, vague and 03:12:47PM
ambiguous. Calls for 03:12:48PM
speculation. 03:12:50PM
But you can answer. 03:12:50PM
Outside the scope. 03:12:51PM
You can answer. 03:12:52PM
THE WITNESS: Yeah, I 03:12:52PM
don't know for sure. 03:12:53PM
- - - 03:12:53PM
BY MR. COLLINS: 03:12:53PM
Q. Now, what does it mean to 03:12:53PM
you that Callaway, in its '97 10K, raised 03:12:55PM
it as a negative? 03:12:59PM
Does that have any impact on 03:13:00PM
your opinion? 03:13:02PM
A. Yes, for Callaway or -- 03:13:02PM
Let me put it this way. 03:13:04PM
And, again, you know, I do 03:13:06PM
agree with Ochoa on the point that, gray 03:13:09PM
market sales attract different firms from 03:13:12PM
the same industry differently. 03:13:14PM
Callaway had been the only 03:13:15PM
game in town for large head drivers since, 03:13:17PM

Page 281

like, '91. It was not until '97/'98 that 03:13:21PM
others started to introduce a lot of their 03:13:24PM
clubs. 03:13:27PM
Callaway was it. They were 03:13:27PM
not only hot over a year or two. They 03:13:29PM
were there, and they had irons and putters 03:13:32PM
and drivers and balls and everything else. 03:13:34PM
A gray marketer, a diverter, 03:13:38PM
will always be more attracted to products 03:13:40PM
from a Callaway than they would to an 03:13:43PM
Adams, because they are easier to sell, 03:13:47PM
and as brand strength, it has brand 03:13:49PM
prestige. It has brand awareness. 03:13:53PM
If a golf shop did not 03:13:54PM
carry, Callaway; oh, my God, what did I do 03:13:56PM
to deserve this? Because they'd have no 03:14:00PM
credibility with many golfers. 03:14:03PM
So, is that surprising to me 03:14:05PM
with those characteristics that there be 03:14:06PM
tremendous pressure for diverters to 03:14:06PM
acquire Callaway clubs and get them to 03:14:09PM
anyone? 03:14:11PM
So, given its level of 03:14:11PM
sales, over 900,000,000; given its brand 03:14:13PM

EXHIBIT 11

EXHIBIT 11

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

- - -

IN RE: ADAMS GOLF, INC. :
SECURITIES LITIGATION :

X

ORAL DEPOSITION

OF

CHRISTOPHER M. JAMES

Friday, August 11, 2006

- - -

Oral deposition of CHRISTOPHER M. JAMES, held at the offices of AKIN GUMP STRAUSS HAUER & FELD, LLP, 590 Madison Avenue, New York, New York, commencing at 8:30 a.m., reported by Pamela Harrison, RMR, CRR, CSR and Notary Public.

- - -

RSA/VERITEXT COURT REPORTING COMPANY
1845 Walnut Street, 15th Floor
Philadelphia, PA 19103
(215) 241-1000 (888) 777-6690

the hypothetical situation that Barney Adams harbored such a belief, would that constitute some evidence?

A. That -- of what?

Q. Some evidence that the gray market represented part of the reason for the decline in analyst expectations.

A. Without a -- what I would require for that is a link between his hypothetical belief and a communication with analysts regarding that belief to be able to assess whether their forward-looking earnings estimates were revised based upon Barney Adams' belief about gray marketing.

Q. Did Barney Adams communicate with the analysts in connection with fourth quarter expectations?

A. I think you asked me that question and I answered he did.

Q. Okay. That's fine.

Now, at least under the analysis -- well, thank you.

How does the market in general react to new information that contains both